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Department of
Veterans Affairs

Dentistry

Interdisciplinary Management of Patients Having Medically Compelling Needs for Dental Treatment

Program Guide

G–2, M–4
October 23, 1990 (Revised)

Veterans Health Services and
Research Administration
Washington DC 20420

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FOREWORD

The revision of this program guide is to assist in the local development of interdisciplinary treatment protocols addressing the management of hospitalized patients having medical problems complicated by or related to oral conditions whose treatment is usually in the province of the Dental Service. It may also be used to assist HSRO (Health Systems Review Organization) staff in the development of quality assurance monitors or generic screening criteria for patients with interrelated medical/dental problems. It is emphasized that the protocols published in this guide are examples only. The development of protocols by physician and dentist staff members at each VA (Department of Veterans Affairs) medical facility is mandated elsewhere. Such development should reflect local case mix as well as differences in practice procedures. We trust, however, that the material in this publication will be helpful to all concerned.

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DEPARTMENT OF VETERANS AFFAIRS
INPATIENT DENTAL PROGRAM
MISSION STATEMENT

VA is required by statute to provide needed care to eligible veterans. Public Law 96-22, section 102(a), enacted June 13, 1979, amended 38 U.S.C. 610(c) and relates specifically to priorities for dental care of hospitalized veterans. Based on these statutes, the mission of the inpatient dental program is, therefore, to provide dental services, treatment and/or related dental appliances for dental conditions associated with, or aggravating a medical problem for which the veteran is receiving hospital care, for inpatient dental emergencies, and for inpatients with a compelling medical need for dental care. These stipulations apply whether or not the dental problem is service-connected, i.e., if a veteran has been admitted to receive medical care, and dental treatment is professionally recognized as a necessary component of that care, it should be provided. VA is pledged to provide a broad spectrum of high quality dental care to veterans who are thereby eligible and in need of such care. The establishment of interdisciplinary protocols will ensure a coordinated approach to patients with interrelated medical/dental problems.

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1. INTRODUCTION

a. **Purpose.** The purpose of this Dentistry Program Guide is to assist physicians and dentists of VA medical center medical staffs in the local development of interdisciplinary treatment protocols addressing the management of hospitalized patients having medical problems complicated by or related to oral conditions whose treatment is usually in the province of the Dental Service.

b. **Program Goals.** The following goals describe the desired outcomes of the Interdisciplinary Treatment Protocols:

(1) Provide the highest quality of care possible for patients with interrelated medical/dental problems.

(2) Establish processes to assure timely, appropriate, cost-effective care of patients identified in the protocols.

(3) Assure that neither length of stay is increased nor necessary medical care is delayed by the rendering of indicated dental care.

(4) Improve the educational process of residents and trainees involved in the treatment of protocol patients.

c. **Scope**

(1) This guide primarily relates to the inpatient setting. However, the protocols and management guidelines address important treatment concerns for any patient falling into one of the 11 diagnostic groups and, as appropriate, can be applicable to outpatients as well.

(2) This guide cannot be used to circumvent eligibility requirements as established under 38 U.S.C. 610(c) and implemented by applicable VA directives. Prioritization of dental care is outlined in M-4, "Dentistry."

(3) This publication is not meant to dictate at any medical center. Rather, the material is intended to serve as examples for use by local staffs in the development of protocols appropriate to their medical center.

2. PROGRAM CONTENT AND PROCEDURES

a. **Identification of Diagnostic Groups.** The formulation of interdisciplinary protocols has been mandated by VA directive. Eleven diagnostic groups have been identified that include medical conditions for which physician/dentist interaction is frequently necessary. Examples of protocols relating to the interdisciplinary management of patients with these problems are contained in this guide. The diagnostic groups are as follows:

(1) Head and Neck Malignancy

(2) Cardiovascular Disorders

(3) Advanced Liver Disease

(4) Joint Prostheses

(5) Nutritional and Metabolic Deficiencies

(6) End Stage Renal Disease

(7) Immunocompromised Patients

(8) Pulmonary Disease

(9) Patients with Mental Disorders

(10) Substance Abuse

(11) Physically Handicapped Patients

b. **Interdisciplinary Teamwork.** The examples contained in this guide, may be used by physician and dentist members of the medical staff to develop protocols appropriate to their medical center. Modifications are encouraged on the basis of local practice patterns and patient mix. Considerations of quality care and medical risk should be uppermost. Close coordination and communication between primary care physicians and dentists responsible for the dental management of protocol patients is necessary for the success of the program. Dental participation in treatment planning conferences of the primary-care service is encouraged wherever feasible. Such efforts will ensure appropriateness, timeliness, and continuity of care so essential to patient management.

c. **Program Evaluation.** Continuing evaluation of the implementation and applicability of developed protocols should be accomplished through the quality assurance process at each medical center. Continuous monitoring should be established using criteria appropriate to each of the protocols developed. Physicians and dentists responsible for management of protocol patients should develop criteria and standards and use all appropriate local and external peer review processes to assure quality patient care.

3. PROTOCOL EXAMPLES

a. Guidelines for Dental Involvement in the Management of the Head and Neck Cancer Patient

(1) Background/Rationale

(a) The significant intraoral side effects of cancerocidal dosages of radiation and/or chemotherapy for head and neck malignancies are critical patient management considerations for all physicians and dentists responsible for treatment of head and neck cancer patients. The side effects include:

1. **Osteoradionecrosis.** Any existing or incipient dental infection, or even a disruption of mucosal integrity may result in a progressive, incapacitating, refractory necrotizing osteomyelitis secondary to radiation-induced tissue hypoxia, hypovascularity, and hypocellularity.

2. **Mucositis.** Soft tissue exposure to radiation results in an inflammatory mucosal reaction which becomes progressively more intense during radiotherapy and may interfere with nutritional intake. Similarly, chemotherapeutic agents often produce an intensely painful stomatitis. The condition usually subsides after therapy is completed.

3. **Xerostomia.** Radiotherapy produces qualitative and quantitative changes in saliva production resulting in mucosal irritations and difficulty with mastication, swallowing, and maintenance of oral hygiene.

4. **Loss of Taste.** Most patients undergoing radiotherapy will experience loss of taste sensation. The effect is usually transient, but can be permanent.

5. **Radiation Caries.** Extensive, rapid decay of teeth is primarily the result of changes in salivary pH and flow (Quantity).

6. **Hypersensitivity of Teeth.** Cervical or cemental sensitivity can develop in patients receiving radiation therapy.

7. **Trismus.** Limited jaw opening may develop 3 to 6 months after radiation therapy and may complicate eating, oral hygiene and dental treatment.

8. **Candidiasis.** Overgrowth of candida albicans is a common occurrence in patients receiving chemotherapy.

9. **Chemotherapy-induced intraoral hemorrhage.** Thrombocytopenia with resultant spontaneous or traumatically induced ecchymosis, hematoma, or frank gingival bleeding may occur during or following a course of chemotherapy.

10. **Iatrogenic malocclusion.** Ablative surgery for head and neck malignancies will often create intraoral tissue deficits of strategic structures. For example, resection of a portion of the mandible will usually result in a debilitating malocclusion unless the remaining segments of the mandible are stabilized in their normal anatomic relationship with the maxilla. Similarly, removal of all or part of the palate will interfere with both deglutition and speech. Experienced oral maxillofacial surgeons and maxillofacial prosthodontists should be available to lend their expertise to the resolution of these problems.

(b) Early involvement of the Dental Service for evaluation and proper timing of any necessary dental treatment will provide appropriate integration of medical/dental care, reduce management complications, dramatically improve the quality of life, and best serve the health and welfare of the patients involved.

(c) Most patients having a malignancy requiring irradiation of the oral area should generally have dental treatment performed prior to radiotherapy since the risks associated with extraction of teeth or development of infections are much greater in irradiated bone. However, in patients whose prognosis is poor or for whom wide osseous resection of maxilla or mandible is contemplated, preradiation dental intervention may only delay therapy or place unnecessary discomfort on the patient. In all cases, close communication between physicians and dentists responsible for care is essential.

(2) Protocol Recommendations

(a) Responsibilities

1. All members of the medical staff involved in the primary care of patients with head and neck cancer must assure that, through routine examination or consultation referral, those patients have the opportunity to be evaluated by the Dental Service prior to initiation of treatment. In this regard, Dental Service representation on the Tumor Board is essential.

2. Examining dentists are responsible for the identification and evaluation of oral problems and, with the primary care physician, for assessing the correlation of those problems (or treatment thereof) with the malignancy and its treatment.

3. The Chief, Dental Service, or designee is responsible for determinations regarding eligibility, prioritization and extent of care, as well as the overall supervision of the dental component of treatment.

4. Each treating dentist is responsible for the dental management of patients assigned, coordination with the primary care physician, and the actual delivery of dental care.

5. The Chief, Dental Service, will appoint a team coordinator of the Dental Service Oral Cancer Management Team. This team coordinator will be a member of the Tumor Board and has the overall responsibility for the dental evaluation and management of cancer patients. The team will usually include a preventive dentistry auxiliary and have access to a maxillofacial prosthodontist.

6. The team coordinator will:

a. Attend the Tumor Board and all Head and Neck Planning Conferences in which dental involvement is anticipated;

b. Answer all consultations on head and neck oncology patients;

c. Maintain a permanent head and neck oncology file; and

d. Maintain a working relationship with the various treating services (to include orientation of newly assigned residents to these services).

(b) Procedures

1. Patients with the following will be identified as protocol patients:

a. Newly identified head and neck malignancies.

b. Metastatic and/or recurrence workups.

c. Post-radiation patients.

d. Patients with requirements for maxillofacial prostheses.

e. Patients with osteoradionecrosis.

2. The following mechanisms will be utilized to ensure identification of protocol patients:

a. Observation of oral and paraoral symptomology during Dental Service examinations.

b. Review of medical history and findings conducted at the time of oral examination of inpatients and of eligible outpatients undergoing care in the dental clinic.

c. Consultation requests from appropriate services or clinics; i.e., Head and Neck General Surgery, Plastics, Radiotherapy, etc.

3. Retrospective review of daily G&L (Gains and Losses) sheets for specific admitting diagnoses and review of special procedures or operating room schedules may be used as quality assurance measures.

4. Completion of a comprehensive dental evaluation and formulation of specific treatment recommendations will be guided by the following:

a. A comprehensive oral examination and specific treatment recommendations should be completed within 24 hours following identification of a protocol patient.

b. Dental treatment recommendations will be formulated according to acceptable dental practice with specific consideration of the patient's medical status, risk factors, restrictions, limitations, therapeutic plan; i.e., radiotherapy, surgery, (or both) and prognosis.

c. Unless the veteran has statutory entitlement to comprehensive outpatient dental care, the dental treatment provided to VA inpatients will be limited to that which is:

(1) Professionally defensible as essential to the treatment of their medical problem,

(2) Emergent (pain, trauma, hemorrhage or acute infection),

(3) Needed to maintain reasonable health, nutritional viability and quality of life in long-term patients (over 100 days of hospitalization).

d. The dental examination will be documented in the medical record (VA Form 10-7978f, Oral Maxillofacial Defined Data Base or other approved oral exam form). The patient's primary care physician will be advised of the dental findings and the dental recommendations regarding patient management via telephone and/or a progress note. Countersignature of the dental treatment plan will be requested.

5. The following considerations by a treating dentist are required prior to initiation of care:

a. For inpatients, a current medical status including history, symptoms, diagnosis, physical examination, current labs, special studies, current medications, and the recommendations of the primary care physician will be fully documented prior to dental treatment. It is imperative that the primary care physician is briefed on the type and extent of dental treatment planned and any anticipated complications so that proper coordination with the patient's therapeutic plan is accomplished.

b. Stable protocol outpatients with acute dental pain or infection may be managed prior to physician consultation. Only the minimum intervention required to control the acute situation will be provided. The safety and well-being of the patient will receive the highest priority. Any further treatment of the patient's dental needs will be deferred until the primary care physician can be consulted.

c. If the patient is to be hospitalized for dental treatment, the following criteria will usually be applied:

(1) If the primary indication for the hospitalization is the medical status, the patient will be admitted to the appropriate Medical or Surgical Service, with Dental Service consulting.

(2) If the primary indication for the hospitalization is the dental problem, the patient will be admitted to the Dental Service, with the appropriate Medical or Surgical Service consulting.

6. Coordination of treatment is a joint responsibility of the dentist and the primary care physician, and will be guided by the following:

a. The timing and sequencing of dental and oncologic treatment are critical, requiring individual attention for each case.

b. Special restrictions, timing of radiotherapy, surgical plan, and management of the patient's overall condition will be coordinated with the primary care physician via direct contact or telephone.

c. Modifications in the delivery of dental care will be coordinated by the treating dentist following consultation with the primary care physician.

c. **Management Guidelines.** The following information is provided primarily for dentist members of the medical staff to serve as guidelines in considering and delivering dental care to patients with head and neck malignancies.

(1) **Newly Identified Head/Neck Malignancies**

(a) Most patients to be treated for head/neck malignancies will have been admitted for that purpose by services other than Dental Service (Oncology, Plastics, ENT, General Surgery, etc.). Priority referral to the Dental Service for evaluation and, similarly, priority treatment by the Dental Service will be notable items in the quality assurance assessment for the care of these patients.

(b) Detection of early or occult, previously undiagnosed oral cancers is one of the several reasons for oral soft tissue screening examinations done by the Dental Service on newly admitted patients. Findings that are considered abnormal or suspicious will be dealt with in the following manner:

1. All such lesions will be given a careful examination, submandibular and/or cervical areas will be palpated for enlarged or indurated lymph nodes, and a written description of the findings will be recorded in the medical chart. All possible etiologic factors will be eliminated and the patient scheduled for reexamination in 10 days, (unless, in the judgement of the treating dentist, delaying a biopsy is unwarranted.)

2. Any oral lesion persisting 10 days without obvious etiology will be considered malignant until proven otherwise. In addition to a written description, the clinical presentation should be documented by photograph prior to biopsy. The Service (Head and Neck, Plastics, ENT, General Surgery, etc.) that is likely to provide definitive treatment if the lesion is malignant should be requested to review the case prior to biopsy.

3. A biopsy will be obtained to establish the histologic diagnosis.

(2) **Metastatic Workup**

(a) All patients for whom a diagnosis of head and neck cancer is established will undergo adequate metastatic evaluation prior to presentation to Tumor Board.

(b) Metastatic workup will include appropriate studies; i.e.. routine labs, liver/spleen scan, posteroanterior and lateral chest radiographs, bone detailing radiographs (when extension to bone is suspected), CT scan of the primary tumor, neck, and brain when

primary tumor is larger than T2, barium swallow, creatinine clearance, pulmonary function tests, and Hematology/Oncology, Otorhinolaryngology, Radiotherapy, and Dental Service consultations.

(c) Aerodigestive endoscopy is also required to document the extent of existing disease and to rule out the simultaneous existence of additional primary disease.

(d) After completion of the above examination, the patient will be scheduled for presentation to Tumor Board for final evaluation and treatment recommendations.

(3) **Dental Evaluation**

(a) All patients for whom a diagnosis of head and neck cancer is established, will undergo comprehensive dental evaluation and treatment. Dental treatment plans will give primary consideration for earliest possible treatment of the tumor; with secondary considerations for reduction of treatment morbidity and ultimate reconstruction. The application of ablative modalities such as surgery, radiotherapy, and chemotherapy will be anticipated in the formulation of the dental treatment plan.

(b) All nonrestorable teeth will be extracted at the earliest possible time to permit initiation of ablative cancer therapy. The following criteria will be used to establish nonrestorability:

1. Extensive decay involving the pulp or precluding restoration of the tooth.

2. Nonfunctional teeth (unless periodontally uninvolved and strategic for an eventual prosthesis).

3. Mobility greater than 1+.

4. Periodontal pockets greater than 4mm.

5. Periodontal disease with furcation involvement.

6. Periodontal disease with loss of more than 1/2 of the supporting alveolar bone.

7. Marginally restorable teeth where there is no apparent hope of patient compliance with oral hygiene control.

(c) Functional teeth which are not judged nonrestorable by the above criteria will be retained.

(d) Patients with partially or completely edentulous alveolar ridges will be clinically and radiographically evaluated to determine the presence of intrabony pathology, and deterrents to future prostheses; i.e., cysts, retained dental roots, bony prominences or undercuts, epulis fissurata, etc.

(e) Existing dental prostheses will be removed from the mouth indefinitely. Following cancer therapy, the patient will be regularly evaluated to detect complications and determine the feasibility of resuming denture wear or initiating prosthodontic reconstruction.

(4) **Tumor Board.** The dental team coordinator or designee will attend Tumor Board to participate actively in the evaluation and/or treatment planning for head and neck cancer patients.

(5) **Dental Therapy**

(a) When radiotherapy or chemotherapy is to be employed in the cancer treatment, it is generally in the patient's interest to complete any dental care, especially any oral surgery, prior to initiation of the radiation or chemotherapy. Indicated dental treatment will be provided expeditiously in order not to delay cancer treatment unnecessarily.

(b) Removal of nonrestorable teeth, alveoloplasty with primary closure of soft tissue for correction of edentulous alveolar prominences or undercuts, and excision of dentoalveolar pathoses will be performed at the earliest possible time using an appropriate anesthetic modality. Following timely suture removal and acceptable healing (minimal: 14 days, ideal; 21 days), the patient may start the radiotherapy. Although it is generally accepted that any needed oral surgery should be accomplished prior to initiation of radiotherapy or chemotherapy, there may be times when, in the collective opinion of the Tumor Board, it is in the best interest of the patient not to delay treatment. In other instances, therapy is inadvertently begun for patients needing oral surgery. In either of the above situations, the oral surgery should usually be delayed 3 to 4 weeks following completion of the radiotherapy course. Extractions or dentoalveolar surgery during the course of radiation therapy is not recommended. The use of adjunctive hyperbaric oxygen therapy should be considered prior to any surgical intervention in irradiated tissue.

(c) Dental treatment, including surgery, can be initiated or resumed in patients receiving chemotherapy after each treatment cycle when the platelet count has returned to greater than 50,000/cu. mm. Patients receiving chemotherapy alone should be allowed to continue to wear any serviceable prostheses they require to help maintain adequate nutrition. Close supervision should be maintained to ensure that any oral ulcerations that may develop as a result of denture pressure are promptly managed by application of soft tissue conditioners and/or discontinuing use of the prosthesis.

(d) All carious lesions will be excavated and amalgam or composite restorations placed to assist in caries control and hygiene maintenance.

(e) Any required special appliances (radiation carriers, tissue displacers, cone locating devises, stents, splints, and obturators) will be constructed in close cooperation with the primary surgeon and/or radiation therapist as early in the treatment planning stage as possible.

(f) Patients with salvageable teeth will be placed in an intensive preventive maintenance program which will include:

1. Dental prophylaxis and oral hygiene instruction.

2. Proper toothbrushing t.i.d. with a flouride dentifrice.

3. Proper use of dental floss.

4. Daily application of flouride gel (preferably via custom fabricated carriers.)

5. Use of artificial saliva, if indicated.

6. Use of 0.1 percent chlorhexidine gluconate (Peridex). Consideration should be given to the addition of Peridex to the preventive regimen. Peridex prepared without the alcohol base may be useful in controlling mucositis, gingivitis, and periodontal disease.

7. Physical therapy. Following therapeutic radiation to fields involving the muscles of mastication and/or temporomandibular joints, early intervention with range of motion exercises for the mandible may decrease the morbidity associated with postradiation trismus.

(g) All patients should be placed into an appropriate recall program supervised by the dental hygienist (or other appropriate personnel).

(h) Patients with significant hard and soft tissue defects from ablative surgery, will be evaluated by the prosthodontist and oral and maxillofacial surgeon with consideration for prosthetic and/or surgical restoration of orofacial function and esthetics. Preoperative construction of prostheses and obturators may be appropriate when adequate lead-time is available before oncologic surgery.

(6) **Complications** following radiation therapy or combined modalities require special consideration:

(a) **ORN (Osteoradionecrosis)**

1. **Prevention.** The incidence of ORN is reduced by minimizing alveolar trauma and irritation, by elimination of dental sepsis and the need for post-radiation oral surgical intervention, and by allowing adequate healing of extraction sites prior to radiation therapy. The ideal minimum time between extractions or dentoalveolar surgery and initiation of radiation therapy is 21 days. However, few oncologists will agree to this lengthy delay before starting radiation therapy. Fourteen days should be considered the absolute minimum healing time. If radiation therapy must be started before 21 days, the patient, treating physician, and radiation therapist must understand that a greater risk of ORN exists. It must be recognized that responses to radiotherapy are variable and that a significant number of patients will develop spontaneous ORN as a result in inability of the irradiated tissue to replenish normal cellular turnover.

2. **Treatment.** It must be recognized that the role of HBO (hyperbaric oxygen therapy) in the treatment of ORN is well established and that successful protocols have been documented. Whenever possible, adjunctive HBO should be considered prior to oral surgery involving radiated tissue. Most cases of ORN will not respond to conservative therapy (appropriate antibiotics, irrigating rinses, and sequestrectomy). Needless delay in resolution and increased morbidity can usually be avoided by early referral for HBO therapy as its accessibility and cost permit. A National Resource Center for Hyperbaric Oxygen Therapy at the VA Medical Center in Dayton, Ohio, can be consulted regarding adjunctive HBO.

(b) **Mucositis.** Mild to moderate mucositis can be managed by alteration of the diet, oral lubricants, adequate hydration, topical anesthetics, and 0.1 percent chlorhexidine gluconate. Discontinuance of alcohol and tobacco use is strongly encouraged. Severe cases may require reduction of daily radiation dosage or temporary suspension of treatment to allow the reaction to subside. A 10 percent loss of body weight often mandates a suspension of cancer therapy until body weight is regained. However, such suspensions may detrimentally affect the treatment outcome.

(c) **Xerostomia.** The use of VA oralube or other saliva substitute may reduce patient discomfort, especially in conjunction with meals.

(d) **Loss of Taste.** Use of multivitamins with zinc can be helpful. When loss of taste is compounded by mucositis and xerostomia, the patient's desire and ability to tolerate oral feedings may be significantly impaired.

(e) **Radiation Caries.** Control of radiation caries is accomplished via oral hygiene measures, topical applications of flouride gel, and dental restorations. If the decay process is so advanced that restorations can no longer be placed, the involved teeth should be smoothed so that there will be no sharp, irritating edges. Even pulpally involved teeth may not be symptomatic or necessarily go on to abscess formation. It is generally contraindicated to extract such teeth, especially when the risk of ORN is considered (unless done in conjunction with adjunctive HBO). These teeth can often be indefinitely retained.

(f) **Hypersensitivity of Teeth.** Occasionally teeth outside the field of radiation will develop cervical or cemental sensitivity secondary to the low salivary pH. Topical applications of flouride gel are usually successful in controlling sensitivity.

(g) **Trismus.** Extensive radiotherapy to the region of the temporomandibular joints and masticatory muscles may produce trismus secondary to fibrosis. The patient can usually be managed with a regimen of exercises and analgesics.

(h) **Candidiasis.** If an overgrowth of candida albicans should occur during chemotherapy, a regimen of mycostatin oral suspension rinses or clotrimazole troches should be instituted.

(i) **Chemotherapy-induced intraoral hemorrhage.** Ecchymosis, hematoma or frank gingival hemorrhage will commonly result from minor trauma when platelet counts fall below 20,000/cu. mm. Occasionally, profuse spontaneous gingival hemorrhage may develop. Platelet transfusion may be necessary for control. However, prior to resorting to transfusion, application of local pressure should be tried. Direct digital pressure or custom fabricated polyvinylchloride pressure splints lined with Surgicel or Avitene may be effective.

(j) **Iatrogenic malocclusion.** Resection of a portion of the mandible without stabilization of the remaining segments in their preoperative skeletal relationship will result in distraction of the mandibular segments and a functionally debilitating malocclusion. Strong consideration should be given to the application of some form of stable fixation device. Depending on the situation, extraoral pin fixation, reconstruction bone plate, dental splints, or intermaxillary fixation of dentate segments can prevent this unfortunate and usually unnecessary result. Immediate post-resection fixation will greatly facilitate any subsequent reconstructive surgery. Adequate fixation maintained for a minimum of 3 months following ablative surgery often leads to sufficient fibrosis between the remaining bone to maintain a stable mandibular relationship following removal of the fixation device. In some cases, then, reconstruction of the ablative defect may become an elective procedure.

d. **Dental Follow-up.** Following completion of cancer therapy and dental treatment, patients will be placed into an appropriate recall system coordinated by the dental hygienist (or other assigned personnel). Each recall patient will be examined by the Dental Team Coordinator to evaluate the patient's dental condition and oral tissue response to cancer therapy. Patients will be seen monthly for the first year, bi-monthly for the second year, quarterly for the third year, twice yearly during the fourth year, and yearly thereafter. Dental recall appointments should be coordinated with the patient's oncology recall appointments whenever possible.

REFERENCES

1. Marx, R.E. and Johnson, R.P.: Studies in the Radiology of Osteoradionecrosis and their Clinical Significance, Oral Surgery, Oral Medicine, Oral Pathology 64: 379-390, 1987.

2. Klath, E.V. and Others.: A study of factors contributing to the development of osteoradionecrosis of the jaws, Journal of Prosthetic Dentistry, 59: 194-201, 1988.

3. Feretti G.A. and Others.: Chlorhexidine for prophylaxis against oral infections and associated complications in patients receiving bone morrow transplant, JADA, 114: 461-7, 1987.

4. Sonis, S.T., Fazio, L.: Principles and Practices of Oral Medicine, W. B. Saunders Co., Philadelphia, PA.

b. Guidelines for Dental Involvement in the Management of Patients With Cardiovascular Disease

(1) Background/Rationale

(a) Patients with cardiovascular disease have decreased cardiac reserves, limited tolerance for stress, and may be at risk from bacteremias caused by intraoral infections and treatment manipulations. Dental intervention without consideration for the patient's cardiac status is associated with an increased potential for myocardial infarction, infective endocarditis, acute congestive heart failure, cerebrovascular accident, and sudden death.

(b) Early Dental Service involvement in the evaluation of the patient, appropriate modification of dental care delivery, and proper timing of necessary dental treatment will permit optimal integration of medical and dental care, reduce management complications, and best serve the health and welfare of patients with cardiovascular disease.

(2) Protocol Recommendations

(a) Responsibilities

1. All members of the medical staff involved in the primary care of patients with cardiovascular disease must assure those patients the opportunity to receive an oral and maxillofacial evaluation via routine Dental Service examination or consultation referral.

2. The Chief, Dental Service, or designee, is responsible for determinations regarding eligibility, prioritization and extent of care, as well as the overall supervision of the dental component of treatment.

3. The examining dentist is responsible for the recognition of potential protocol patients, the identification and evaluation of oral problems, and the correlation of those problems with the specific cardiovascular condition.

4. The treating dentist is responsible for the dental management of patients assigned, coordination with the primary care physician, and the actual delivery of dental care.

5. Members of the Dental Service staff will maintain certification in CPR (cardiopulmonary resuscitation) in accordance with local medical center policy and will be knowledgeable regarding activation of the facility's emergency care system.

(b) **Procedures**

1. Patients with the following cardiovascular disorders will be identified as potential protocol patients:

a. MI (Myocardial Infarction).

b. ASHD or ASCVD (Atherosclerotic Heart Disease or Atherosclerotic Cardiovascular Disease).

c. HTN (Hypertension).

d. CHF (Congestive Heart Failure).

e. Bacteremia-risk patients:

(1) HD (Rheumatic Heart Disease).

(2) Pathologic murmurs: (All diastolic murmurs, all systolic murmurs graded louder than II/VI, and all I/VI or II/VI systolic murmurs determined by the cardiologist or through echocardiography to be organic or non-functional).

(3) Status post valve replacement.

(4) Status post vascular graft (within 3 months) - indefinitely if alloplastic graft. Peripheral grafts such as dacron grafts will usually be covered by endothelium. However, in an unpredictable number of cases, portions of the graft will not have an endothelium covering, (known as "skip lesions") and be susceptible to infection from a bacteremia.

(5) Status post cardiac transplant.

(6) History of previous infective endocarditis.

2. The following mechanisms may be used to identify patients with cardiovascular disease:

a. Ward or clinic examinations conducted on newly admitted inpatients.

b. Medical history reviews on inpatients previously examined by the Dental Service and eligible outpatients receiving care in the dental clinic.

c. Consultation requests from appropriate Services or clinics: i.e., Cardiology, Medicine, Thoracic Surgery, Geriatrics, or others.

3. Retrospective reviews of daily G&L sheets for patients with cardiovascular admitting diagnoses and reviews of special procedure or cardiac catheterization schedules may be used as quality assurance measures.

4. A comprehensive dental evaluation will be completed and specific treatment recommendations will be formulated for each protocol patient.

a. All patients will receive appropriate clinical and radiographic oral and maxillofacial evaluations to assess dental needs.

b. Clinical and radiographic examinations and specific treatment recommendations should be completed within 24 hours following identification of a protocol patient.

c. Dental findings and treatment recommendations will be recorded on the VA Form 10-7978f or other approved oral exam record. In some circumstances, they may also be documented via a consultation response or a progress note.

d. Dental treatment recommendations will be formulated according to acceptable dental practice with specific consideration for the patient's cardiovascular status, risk factors, restrictions, limitations, level of myocardial compensation, and prognosis.

e. Unless the veteran has statutory entitlement to comprehensive outpatient dental care, the dental treatment provided will be limited in type and extent to that which is:

(1) Professionally defensible as essential to the treatment of the veteran's medical problem.

(2) Emergent (pain, trauma, hemorrhage, or acute infection).

(3) Needed to maintain reasonable health and nutritional viability in patients whose degree of medical disability or risk requires that dental care be provided within the medical center.

(4) Needed to maintain reasonable health, nutritional viability and quality of life in long-term patients (over 100 days of hospitalization).

f. The patient's primary care physician will be advised of the dental findings and the dental recommendations regarding patient management via telephone and/or a note written in the patient's medical record summarizing the findings and recommendations.

g. The physician's concurrence and/or clearance will be obtained via telephone, countersignature of the dental treatment plan, or a physician's order or progress note in the medical record.

(1) Such concurrence and/or clearance will be required prior to initiation of dental care for a cardiovascular inpatient.

(2) Such concurrence and/or clearance are advised prior to initiation of dental care for a cardiovascular outpatient.

5. Wherever and whenever feasible, there should be active participation in cardiovascular treatment planning conferences by a designated member of the Dental Service.

a. A dental examination and tentative treatment plan will be prepared for each patient presented.

b. The patient's dental needs will be correlated with the cardiovascular treatment plan to minimize delays, decrease risks, and reduce potential morbidity which might result from uncoordinated treatment.

6. Coordination of cardiovascular stabilization by the primary care physician with dental management by the dentist will be guided by the following:

a. For all cardiovascular inpatients, the primary care physician will be briefed on the type and extent of dental treatment planned and the complications anticipated so that proper coordination with the patient's medical care can be accomplished.

(1) Special restrictions, adjustments of medications, and management of the patient's cardiac condition during dental treatment will be given by the primary care physician directly or via telephone.

(2) Modifications in the delivery of dental care will be provided by the treating dentist following consultation with the primary care physician.

(3) The patient's current cardiovascular status, including history, symptoms, diagnosis, physician examination, current labs, special studies, current medications, and the recommendations of the primary care physician will be fully documented prior to dental treatment.

b. Stable cardiovascular outpatients may be managed without physician consultation, although such consultation is strongly advised.

The safety and well-being of the patient will receive the highest priority.

c. If the patient is to be hospitalized for dental treatment, the following criteria will usually be applied:

(1) If the primary indication for the hospitalization is the cardiac status, the patient will be admitted to the Cardiology Service with Dental Service consulting.

(2) If the primary indication for the hospitalization is the dental problem, the patient will be admitted to the Dental Service with Cardiology Service consulting

7. Vital signs will be recorded for all cardiovascular patients before and after each dental treatment appointment.

(c) **Management Guidelines.** The following information is provided to serve as guidelines in considering and delivering dental care to patients with various cardiovascular diagnoses:

1. **MI (Myocardial Infarction)**

a. Patients who have sustained an MI within the last 6 months (documented by history, EKG (electrocardiogram) changes, or an episode of elevation of cardiac enzymes) are at greatly increased risk of additional infarction.

(1) Minimal dental intervention will be applied to control an acute dental problem within 6 months of an infarction only after consultation with the patient's primary care physician.

(2) No elective dental care will be administered within the first 6 months following an MI.

b. Once 6 months have elapsed after an MI, elective dental care may be provided consistent with appropriate precautions.

(1) Unstable angina (see below), decompensated CHF (see below), noncompliance with medications, and restrictions in the patient's activities of daily living, i.e., walking, performing simple chores, etc. all indicate significant cardiovascular compromise and may mandate limitations in the type and delivery of dental treatment. Consultation with the primary care physician is mandatory.

(2) When patients are satisfactorily stabilized and dental treatment is initiated; early morning appointments, local anesthesia, inhalation or light intravenous sedation, and vigilant monitoring of the patient's vital signs are advised. Consultation with the primary care physician is advisable.

2. **ASHD or ASCVD (Atherosclerotic Heart Disease or Atherosclerotic Cardiovascular Disease).** Patients with ASHD experience chest pain secondary to relative myocardial ischemia.

a. **Unstable angina** refers to chest pain which occurs following variable amounts of exertion or stress or even at rest and which may not respond to rest or nitroglycerin. Patients with unstable angina will receive emergent or minimally invasive care only after consultation with the primary care physician.

b. **Stable angina** refers to chest pain which results from a predictable amount of exertion or stress and which responds to rest or nitroglycerin.

(1) Patients with stable angina may be given needed dental care. Consultation with the primary care physician is advisable.

(2) Short, relatively stress-free appointments, premedication with nitroglycerin, local anesthesia, and use of inhalation or light intravenous sedation are advised. Adequate monitoring and provisions for medical attention, if necessary, must be prearranged.

(3) Episodes or angina will be treated by sublingual nitroglycerin and oxygen. Refractory episodes must be differentiated from MI.

c. ASHD patients who are scheduled for coronary artery bypass graft (CABG) surgery will have all non-emergent dental care deferred until 3 to 6 months after surgery. The bypass surgery will improve the myocardial reserve.

d. For ASHD patients who have received CABG surgery, appropriate antibiotic prophylaxis is indicated if intervention is necessary for an acute dental problem within the first 3 months following CABG or indefinitely after CABG if alloplastic grafts (not the patient's own veins) were used.

3. **HTN (Hypertension).** Patients with hypertension are at increased risk of CVA (cerebrovascular accident), MI (myocardial infarct), CHF (congestive heart failure), and renal failure. Compliance with medications and diet are often less than ideal in these patients.

a. Satisfactory control of the blood pressure will be assured prior to elective dental care. (Maximum systolic pressure of 150 mm Hg and maximum diastolic pressure of 95 mm Hg are suggested limits.)

b. Reasonable control of the blood pressure will be achieved prior to emergency dental intervention. (Maximum systolic pressure of 170 mmHg and maximum diastolic pressure of 100 mm HG are suggested limits.)

c. Inability to achieve control of the blood pressure will mandate that treatment be deferred.

(1) If the patient has not been compliant, assure compliance and reschedule.

(2) If the patient has been compliant, obtain medical consultation prior to treatment.

d. The use of epinephrine in combination with local anesthetics remains controversial in these patients.

(1) There are only 0.02 mg of epinephrine per carpule of an anesthetic solution containing 1:100,000 epinephrine. Most authorities permit the use of these small amounts of epinephrine since the superior anesthesia obtained precludes the release of larger amounts of endogenous catecholamines (280 mcg./minute in patients experiencing pain). Adequate aspiration, slow injection, and deposition into areas of relative avascularity minimize cardiovascular effect.

(2) The use of epinephrine-impregnated retraction cord is contraindicated in these patients.

e. Good doctor/patient rapport, psychosedation techniques, and intravenous or inhalation sedation are generally useful in these patients.

4. **CHF (Congestive Heart Failure).** CHF usually occurs secondary to some other cardiac condition. Patients with CHF are frequently managed with digoxin, salt and water restriction, and diuretics.

a. The presence of DOE (dyspnea on exertion), rales or rhonchi, pedal edema, 2+ pillow orthopnea, JVD (jugular venous distension), hepatojugular reflux, or PND (paroxysmal nocturnal dyspnea) indicate poorly compensated CHF. Poorly compensated patients should be referred for medical treatment prior to dental care.

b. Well-compensated patients may be considered for dental care without mandatory consultation.

c. Serum K (potassium) levels should be closely monitored in CHF patients since digoxin sensitizes the myocardium to K excess or deficiency and many diuretics increase K excretion.

5. Bacteremia-risk Patients. Patients with RHD (rheumatic heart disease), organic cardiac murmurs, previous episodes of infective endocarditis, atrial fibrillation, valve replacements, intravascular pacemakers, and certain vascular grafts (all alloplasts which are susceptible to "skip lesions" and autogenous grafts less than 3 months old) are at increased risk because of the bacteremia which may occur from dental infections during treatment manipulations.

a. Patients who are at bacteremia-risk will require dental management deigned to minimize the number and magnitude of transient bacteremias.

b. Appropriate antibiotic prophylaxis is required for procedures likely to produce a bacteremia. AHA (American Heart Association) recommendations will be utilized.

(1) Individual judgements will have to be made for patients who may not fit established guidelines.

(2) Infectious Disease consultation will be obtained, as necessary, for patients who require multiple, prolonged, or unusual regimens of prophylactic coverage.

c. It is emphasized that antibiotic prophylaxis does not preclude a significant complication or IE (infective endocarditis); it only minimizes risks. Recognition of the signs and symptoms of complications or IE (lethargy, malaise, low grade fever, changes in mental status or a change in a cardiac murmur) and early aggressive treatment are as critical in decreasing morbidity and mortality as are prophylactic antibiotics.

d. For patients awaiting valve replacement surgery, all preventive, surgical, and needed restorative dental treatment are indicated prior to the cardiac surgery, since the risks associated with a bacteremia would be less significant for the diseased valve than for the newly placed, prosthetic one.

e. Measures to locally reduce the oral flora, e.g., chlorhexidine gluconate, 0.12 percent, mouthrinse immediately before treatment, should be considered in addition to systemic prophylaxis.

6. **Anticoagulated Patients.** Certain cardiovascular patients (those with prosthetic valves, thromboembolic phenomena, or other flow disturbances) are therapeutically anticoagulated.

a. **Heparin,** a circulating direct anticoagulant, is administered intravenously and has a discrete, short term effect. Therapy is monitored via the PTT (partial thromboplastin time) and may be immediately reversed with protamine sulfate. Control of the heparinization, which is usually reserved for inpatients, should be supervised by the patient's primary care physician.

b. **Coumadin** is administered orally and has a delayed onset and a prolonged effect. Therapy is monitored via the PT (prothrombin time). Coumadin decreases the synthesis of active factors II, VII, IX, and X by the liver. Its effect may be reversed over several hours by the administration of vitamin K and quickly reversed by the transfusion of whole blood or plasma, which replaces the missing factors. When coumadin is electively withdrawn or reduced, pretreatment doses should be restarted on the day of dental treatment to compensate for the delayed onset and minimize rebound hypercoagulability which can result from abrupt or prolonged withdrawal.

c. **ASA (aspirin)** decreases platelet aggregation and also has a prolonged effect (10 days). Therapy is monitored via the Ivy or Template bleeding time.

d. Adjustment of the PT and PTT to 1.5 to 2.0 times the control value precludes problematic bleeding, yet maintains therapeutic anticoagulation. Consideration should be given to not changing the patient's regimen in cases in which the risks of hemorrhage

associated with dental treatment are nonexistent. Close cooperation between the dentist and primary care physician are mandatory.

e. The use of local hemostatics, i.e., Gelfoam, Surgicel, sutures, primary closure, etc., will permit higher levels of anticoagulation to be safely maintained during dental treatment. Use of tranexamic acid mouthrinse has not yet been approved in this country.

(d) **Followup.** Appropriate outpatient or followup appointments will be assured for all cardiovascular protocol patients undergoing dental treatment. Follow-up contact with the patient's primary care physician in also advised.

REFERENCES

1. McCarthy, F.M.: Emergencies in Dental Practice, WB Saunders Co., Philadelphia, PA, 1972, pp 205.

2. Halpern, I.L.: Patients's Medical Status - A Factor in Dental Treatment, Oral Surg: 39(2): 216-226, 1975.

3. Irby, W.B.: Current Advances in Oral Surgery, Volume II, CV Mosby Co., St. Louis, MO, 1977, pp 1-19.

4. Rose, Louis F. and Kaye, Donald: Internal Medicine for Dentistry, C.V. Mosby Co., St. Louis, 1983., pp 452-587.

c. Guidelines for Dental Involvement in the Management of Patients With Liver Disease/Hepatitis

(1) **Background/Rationale.** Advanced liver disease is associated with impaired metabolic capacities, significant malnutrition, and disease-related coagulopathies. Dental treatment without consideration for a patient's liver dysfunction and/or inadequate pretreatment evaluation is associated with an increased potential for morbidity and mortality. Extensive and/or invasive dental procedures on patients with severe liver-related impairments should take place in a hospital environment and universal precautions must be observed. Post-operative bleeding, behavioral disorders, seizures, delerium tremens, and hepatic encephalopathy must be anticipated in compromised patients.

(2) **Protocol Recommendations**

(a) **Responsibilities**

1. All members of the medical staff involved in the primary care of patients with liver disease must assure that, through routine examination or consultation referral, each patient has the opportunity to be evaluated by Dental Service.

2. Examining dentists are responsible for identification and evaluation of oral problems and, with the primary care physician, assessing the correlation of these problems (or treatment thereof) with the degree of liver impairment.

3. The Chief, Dental Service, or designee, is responsible for determinations regarding eligibility, prioritization and extent of care as well as overall coordination of the dental component of treatment.

4. Each treating dentist is responsible for the dental management of patients assigned, coordination with the primary care physician, and the actual delivery of dental care.

(b) **Procedures**

1. Patients with the following liver disorders will be identified as protocol patients:

a. Alcoholic hepatitis and cirrhosis.

b. Hepatitides

(1) Hepatitis A.

(2) Hepatitis B.

(3) Non-A/non-B Hepatitis.

(4) Hepatitis D (delta hepatitis).

(5) Other: drug induced, obstructive, parasitic.

c. Hepatic coma.

2. The following mechanisms will be used by the Dental Service to identify patients with advanced liver disease or hepatitis:

a. Observation of oral and paraoral symptomology during Dental Service examinations.

b. Review of medical history and findings conducted at the time of oral examination of inpatients and of eligible outpatients undergoing elective or emergent care in the dental clinic.

c. Consultation requests from appropriate services or clinics: i.e., Gastrointestinal, Medicine, Alcohol and Drug Detoxification, Geriatrics, Hematology, Psychology, Psychiatry, etc.

3. Retrospective review of the daily G&L sheets for admitting diagnoses and review of daily special procedures may be used as quality assurance measures.

4. Completion of a comprehensive dental evaluation and formulation of specific treatment recommendations will be guided by the following:

a. A comprehensive examination and specific treatment recommendations should be completed within 24 hours following identification of a protocol patient. A summary of the dental findings and treatment recommendations will be provided either as a progress note or as a consultation response.

b. Dental treatment recommendations will be formulated according to acceptable dental practices with specific consideration for the patient's impaired liver status, risk factors, restrictions, limitations, and prognosis.

c. Unless the veteran has statutory entitlement to comprehensive outpatient dental care, the dental treatment provided to VA inpatients will be limited in type and extent to that which is:

(1) Professionally defensible as essential to the treatment of their medical problem,

(2) Emergent (pain, trauma, hemorrhage, or acute infection),

(3) Needed to maintain reasonable health and nutritional viability in patients whose degree of medical disability or risk requires that dental care be provided within the hospital,

(4) Needed to maintain reasonable health, nutritional viability and quality of life in long term patients (over 100 days of hospitalization).

d. Dental findings and treatment recommendations will be recorded on VA Form 10-7978f, or other approved exam form. The patient's primary care physician will be advised of the dental findings and the dental recommendations regarding patient management via telephone or a progress note. Countersignature of the dental treatment plan will be requested.

5. Wherever and whenever feasible, there should be active Dental Service participation in treatment planning conferences of the primary care service. A dental evaluation and tentative treatment plan will be prepared for each patient presented. The patient's dental needs will be correlated with the medical treatment plan to minimize delays, decrease risks, and reduce potential morbidity which might result from uncoordinated treatment.

6. The following considerations by a treating dentist are required prior to initiation of care:

a. For inpatients, a current hepatic status including history, symptoms, diagnosis, physical examination, current labs, special studies, current medications, and the recommendations of the primary care physician must be available and reviewed prior to dental treatment. It is imperative that the primary care physician is briefed on the type and extent of dental treatment planned and any anticipated complications so that proper coordination with the patient's medical care is accomplished.

b. Outpatients with stable liver disease having acute dental emergencies may be managed prior to consultation. However, a CBC (complete blood count) and PT/PTT should be done prior to any invasive procedure. Only the minimum intervention required to control the acute situation will be provided. The safety and well-being of the patients will receive the highest priority. Any further treatment of the patient's dental needs will be deferred until the patient's primary care physician can be consulted.

c. If the patient is to be hospitalized for dental treatment, the following criteria will be applied:

(1) If the primary indication for the hospitalization is the hepatic status, the patient will be admitted to the Gastroenterology Service or Internal Medicine Service, with Dental Service consulting.

(2) If the primary indication for the hospitalization is the dental problem, the patient will be admitted to the Dental Service, with Gastroenterology Service or Internal Medicine Service consulting.

7. Coordination of treatment is a joint responsibility of the dentist and the primary care physician, and will be guided by the following:

a. Special restrictions, adjustments of medications, and dental implications of the management of the patient's medical condition will be coordinated with the primary care physician via direct contact or telephone.

b. Modifications in the delivery of dental care will be coordinated by the treating dentist following consultation with the primary care physician.

(c) **Management Guidelines.** The following information is provided primarily for the dentist members of the medical staff to serve as guidelines in considering and delivering dental care to patients with various liver diseases.

1. General. Any of the diseases produce dysfunction which can cause multiple derangements. Severe liver disease can produce a myriad of problems which impact upon the manner, type and extent of dental care contemplated. Some of these disease processes are specific to the underlying pathologic diagnosis; others are generalized to any liver disease.

a. **Disrupted drug metabolism.** Many drugs that are used in dentistry are primarily metabolized in the liver. For short term usage, normal therapeutic doses are indicated. However, when extended medication is indicated, or when the patient has severely compromised liver function, reduced dosages over shorter time periods may be indicated. Commonly used drugs metabolized in the liver are:

(1) Analgesics - Acetaminophen, narcotics.

(2) Anesthetics - Lidocaine, procaine, Mepivacaine.

(3) Sedatives - Diazepam, barbiturates.

(4) Antibiotics - Ampicillin, tetracycline.

b. **Altered protein metabolism.** Protein (dietary, swallowed blood) in the GI tract is converted to ammonia and other protein metabolites by endemic intestinal bacteria. Normally, the ammonia is absorbed across the gut wall and converted to inactive urea by the liver. With large amounts of protein and/or liver dysfunction, the ammonia circulates unchanged and is associated with lethargy and disorientation leading to a decreasing level of consciousness and coma (hepatic encephalopathy, hepatic coma). Altered protein metabolism also interferes with proper healing. Treatment involves restriction of protein intake; treatment with lactulose to inhibit intestinal absorption of amino acids; or use of neomycin sulfate to decrease gut flora.

c. **Hemorrhagic disorders.** The vitamin K dependent factors (II, VII, IX and X) and non-vitamin K factors (I, V) can be markedly decreased in severe liver disease, resulting in post-surgical, post-traumatic or spontaneous hemorrhage. The best screening tests are the PT (prothrombin time) and PTT (partial thromboplastin time). Hepatic-based coagulopathies are best treated with vitamin K therapy (IM or p.o.), factor replacement therapy or fresh frozen plasma infusion.

2. Specific hepatic disease entities.

a. Alcoholic Hepatitis and Cirrhosis. Besides the possible generalized dysfunctions previously mentioned, alcohol abuse may cause more specific derangements.

(1) An increased gag reflex may hamper adequate intra-oral examination or preclude denture construction or usage. It may be diminished or abolished with nitrous oxide/oxygen inhalation.

(2) Diffuse erythema of the oral mucosa may be seen in alcoholic patients, especially after a binge. This condition is often associated with the increased gag reflex.

(3) Bilateral diffuse parotid gland enlargement is occasionally noted. Similar noninflammatory enlargements may occur in pregnancy and diabetes.

(4) Decreased platelet count may be the cause of a bleeding tendency not diagnosed by the PT or PTT. Indications are made by platelet count or estimate on the differential of the CBC. If the patient's platelet count is below 100,000/mm^3, it may be necessary to transfuse with platelet concentrate prior to any invasive procedure.

(5) Alcoholic patients may frequently present for appointments, even in the morning, with moderate to severe AOB (alcohol on breath). Except in rare instances, treatment should be deferred. There are medical and legal issues to be considered:

(a) Potential for idiosyncratic drug reactions.

(b) Altered level of consciousness and behavior over which the dentist has no control.

(c) The validity of consent or implied consent.

(6) Moderate to severe alcohol abusers may reveal a history of DTs (delirium tremens). Agitation, loss of orientation and hallucinations may be associated with a reduction in alcohol consumption as well as total withdrawal. Adequate hydration, vitamin therapy, and use of a recommended sedative (librium, valium) can avert or minimize the symptoms.

(7) Seizures may occur secondary to alcohol abuse or to alcohol-related head trauma. Several questions need to be addressed:

(a) Is anti-seizure medication prescribed for the patient, and is he compliant?

(b) Does the patient have seizures even while taking his medication?

(c) Does the patient experience a pre-seizure aura?

(d) Do certain drugs and/or stimuli lower the seizure threshold (lidocaine, epinephrine, fentanyl, bright lights, loud music) or raise it (valium, librium)?

(8) Ingestion of large quantities of alcohol over prolonged periods of time is usually accompanied by decreased ingestion of appropriate food and concomitant deficiencies in vitamins C, B-complex, folic acid and zinc. These deficiencies will create classic oral lesions such as glossitis and cheilosis. Folic acid deficiency may present as a smooth tongue. Severe vitamin C deficiency (scurvy) will result in capillary fragility and, intraorally, gingival ulcers, bleeding, periodontitis and loosening of teeth. Zinc deficiency may create a crusting, vesicular eruption around the mouth. The dentist should also be aware of a sweetish, musty order on the breath of patients with liver failure or extensive portal system shunting of blood. In these instances, elective dental treatment should not be considered because of the patient's fragile status.

(9) It must also be kept in mind that there is a strong association between alcohol abuse and use of tobacco. These patients are more prone to develop aerodigestive squamous cell carcinoma.

b. **Hepatitis.** When a patient claims a history of hepatitis or jaundice, an effort must be made to determine the etiology and differentiate alcoholic hepatitis, chemical hepatitis, obstructive biliary disease, and the viral hepatitides. Parameters for evaluation of nonviral liver disease include history, physical examination, and laboratory studies of liver function; i.e., SGOT (serum glutamic-oxalecetic transaminanse), SGPT (serum gamma glutamyl transpeptidase), LDH (lactic dehydrogenase), alkaline phosphatase, and direct and total bilirubin. A history of viral hepatitis requires efforts to identify the type(s) involved.

(1) Hepatitis A (Infectious Hepatitis) runs an acute course with eventual full recovery in most cases. Hepatitis A usually follows ingestion of food contaminated by the fecal-oral route and is generally only problematic in an institutionalized population (retarded, nursing home, etc.)

(2) Hepatitis B (Viral Hepatitis) is far more insidious with a longer onset and more protracted course. Hepatitis B is transmitted parenterally; i.e., opening in the skin, needle stick, transfusion, etc. Patients with hepatitis B may recover fully, may sustain some degree of permanent liver damage, may develop chronically active and transmissible disease, or may develop rapidly fulminant disease resulting in death. Patients with a history of hepatitis are also more prone to develop hepatic carcinoma in later life. Patients whose history indicates a high risk for hepatitis B, i.e., drug addicts, homosexuals, dialysis patients, and patients who have received multiple transfusions, should be considered to be carriers until proven otherwise. Appropriate infection control measures are indicated. Testing for hepatitis is done by serologic examination for HBsAg (Hepatitis B surface antigen) and antibody to surface antigen (anti-HBs). Hepatitis Be antigen (HBeAg) is present uniformly during acute viral hepatitis B. The persistence of HBeAg for more than 10 weeks predicts the chronic type of viral hepatitis for which serologic markers have become available.

(3) The two major mechanisms hepatitis D infection are co-infection and superinfection. Co-infection consists of simultaneous infection with both hepatitis B and D. Superinfection occurs when a chronic hepatitis B carrier is infected with hepatitis D. This often results in fulminant hepatitis or chronic hepatitis D with severe liver disease. Positive HBsAb (Hepatitis B surface antibody) indicates the patient is infective. Positive HBsAb indicates the patient has mounted a successful immune response and is noninfective. All body secretions of active hepatitis B patient, i.e., blood, urine, sweat, semen, saliva, tears, and stool are capable of spreading the disease.

(4) Specific immunity to hepatitis B can be acquired by vaccination. Heptavax-B or Recombivax-HB can be given as a series of three injections over a period of 6 months. Periodic testing for HBsAg titer is recommended to determine if a booster injection is needed. Special precautions are indicated for serologically positive or high risk patients: (1) no casework, i.e., impressions, dentures, partials, etc., can be taken into the laboratory for adjustment or finishing until they can have been properly sterilized by spraying or soaking with a sterilizing agent for the proper time recommended by the manufacturer. (2) All equipment in the operatory should be adequately draped following the guidelines for universal precautions. Masks, gowns, gloves and protective eyeglasses should be worn. All instruments, including hand-pieces, must receive special attention and handling.

(5) Recovery from hepatitis B or hepatitis A imparts type-specific lifelong immunity. It is important to recognize non-A, non-B hepatitis because the disease is chronic in 50 percent of patients and cirrhosis develops in about 20 percent of patients who have chronic disease. Patients (health care workers) with a history of transmitted hepatitis B are a markedly increased risk for developing hepatocellular carcinoma, which is fatal.

(d) **Follow-up.** As eligibility allows, appropriate outpatient and follow-up appointments will be provided for all protocol patients undergoing dental treatment. Follow-up contact with the patient's primary care physician is also advised.

REFERENCES

1. Catone, James A.: Delta Hepatitis: Another Concern for Dentistry, JADA Vol. 112, No. 1, January 1986, pp. 47-49.

2. Council on Dental Materials, Instruments and Equipment, Council on Dental Practice, Council on Dental Therapeutics, Infection Control Recommendations for the Dental Office and the Dental Laboratory, JADA Vol. 116, No. 2, February 1988, pp. 241-248.

3. Hollinger, F. Blaine; Hepatitis B Vaccines - to Switch or Not to Switch, JAMA Vol. 257, No. 19, May 15, 1987, pp. 2634-2636.

4. Chatzinoff, M., Friedman, L. S.: Delta Agent Hepatitis - Infectious Disease Clinics of North America, 1987 Sept. 1 (3): 529-47.

5. Little, James W. and Donald Falace: Therapeutic Considerations in Special Patients in Dental Clinics of North America, July 1984, pp. 467-468.

6. Sampliner, Richard: Advances in the Serology of Viral Hepatitis, Hospital Therapy, November 1988, pp. 59-67.

7. Goldman, D.R., Brown, E.H., Levy, W.K, Slap, G.B., and Sussman, E.J.: Medical Care of the Surgical Patient: A Problem-oriented Approach to Management, J.B. Lippincott Co., Philadelphia, 1982, pp. 326-342.

8. Malamed, S.F.: Handbook of Medical Emergencies in the Dental Office, The C.V. Mosby Co., St. Louis, 1978, p. 13.

9. Rose, Louis F. and Kaye, Donald: Internal Medicine for Dentistry, The C.V. Mosby Co., St. Louis, 1983, pp. 1057-1964.

d. Guidelines for Dental Involvement in the Management of Patients With Joint Prostheses.

(1) Background/Rationale

(a) Many dental procedures are accompanied by transient bacteremias. The orthopedic literature recognizes the potential for failure of major joint prostheses as a result of hematogenous spread of bacteria to the implant site. Once an implant site has become septic, failure of the prosthesis is almost assured.

(b) Deep infection after prosthesis placement is painful, disabling, costly, and may require removal of the prosthesis. Early deep infections can occur during the first several weeks after surgery. In patients with no pre-existing inflammation, infection can also develop 2 or more years after surgery and may be attributed to hematogenous seeding from an infected focus elsewhere in the body or to a transient bacteremia. The incidence of hematogenous seeding resulting in infection has been estimated to be as low as 0.3 percent and as high as 27 percent. Often, extraction of an infected tooth, respiratory infection, or genito-urinary instrumentation or infection are implicated as the

source. Many orthopedic surgeons suggest that patients with joint prostheses receive prophylactic antibiotic coverage before and after dental procedures. Based on the implications of the foregoing information, an argument can be made for presurgical elimination of all dental infection for any patient scheduled for joint replacement surgery.

(c) As an opposing view to routine antibiotic prophylaxis for all joint prosthesis patients undergoing dental care, the American Academy of Oral Medicine's "Statement on Antibiotic Prophylaxis for Prosthetic Joint Replacement Patients" asserts that recommending antibiotics for all such patients would be possibly more detrimental than useful since:

1. joints seem to be infected with flora not found to any great extent in the oral cavity.

2. no one antibiotic exists which has the necessary spectrum to be effective against the organisms that infect the joints as well as the organisms in the oral cavity.

3. prosthetic joints are relatively avascular and have no predisposition to sequestration of organisms.

4. all inference to the oral cavity as a source for joint infection is conjectural.

5. unnecessary development of resistant organisms and patient hypersensitivity are a by-product of the unjustified use of antibiotics.

(d) In a recent study of over 4,000 joint replacements (hip, knee, elbow), 53 eventuated in an infection. Of the 53, approximately 90 percent of the patients had a primary diagnosis of either rheumatoid arthritis or osteoarthritis. The other 10 percent were related to joint degenerations accompanying various other diseases. Patients with rheumatoid arthritis were at greater risk for post-operative infection than any other group. The authors of this paper suggest preoperative elimination of sites of potential bacterial seeding, and suggest that dentists (and other practitioners) should use prophylactic antibiotics for any potentially contaminating procedure for an indefinite period following the surgery.

(e) Sepsis following joint replacement may occur early or may be delayed for months or years and may be related more to contamination of the operative site at the time of placement than to hematogenous seeding. Many experts believe that the dental focus should be on the creation of an oral cavity that is free of infectious foci prior to the placement of the prosthesis rather than on antibiotic coverage for dental procedures done months and years after the prosthesis heals.

(2) Protocol Recommendations

(a) Responsibilities

1. All members of the medical staff involved in the primary care of patients who will receive or who have received joint prostheses must assure that, through routine examination or consultation request, each such patient has the opportunity of evaluation by the Dental Service.

2. Examining dentists are responsible for the identification and evaluation of oral problems and, with the primary care physician, for assessing the correlation of those problems (or treatment thereof) with the placement of the joint prosthesis.

3. The Chief, Dental Service, or designee is responsible for determinations regarding eligibility, prioritization and extent of care, as well as overall supervision of the dental component of care.

4. Each treating dentist is responsible for the dental management of patients assigned, coordination with the primary care physician, and the actual delivery of dental care.

(b) **Procedures**

1. Patients with the following diagnoses will be identified as protocol patients:

a. Major joint procedures

b. Total hip replacement

c. Orthopedic implants (including those used in the maxilla, mandible and other bones of the head placed by the Dental Service Staff)

d. TMJ (temporomandibular joint) prostheses

2. The following mechanisms will be used to identify patients admitted for or who have received joint prostheses:

a. Review of medical history and findings conducted at the time of oral examination of inpatients and of eligible outpatients undergoing care in the dental clinic.

b. Consultation requests from appropriate services or clinics: e.g. Orthopedics, Rehab Medicine, etc.

3. Retrospective review of daily G&L sheets for these types of admitting diagnoses to orthopedic or rehabilitative wards or review of special procedure schedules may be used as quality assurance measures.

4. Completion of a comprehensive dental evaluation and formulation of specific treatment recommendations will be guided by the following:

a. The examination and recommendations should be completed within 24 hours following identification of a protocol patient. A summary of the dental findings and treatment plans will be provided either as a progress note or as a consultation response.

b. Dental treatment recommendations will be formulated according to acceptable dental practices with specific consideration for the patient's oral status, and with the therapeutic goal of reducing the potential for dental sepsis and reducing the number and degree of bacteremias to which the patient might be subjected. Generally speaking, bacteremia-risk patients require early and continued dental surveillance and should be given the highest priority in this protocol category.

c. Unless the veteran has statutory entitlement to comprehensive outpatient dental care, the dental treatment provided to VA inpatients will be limited in type and extent to that which is:

(1) Professionally defensible as essential to the treatment of their medical problems,

(2) Emergent (pain, trauma, hemorrhage, or acute infection),

(3) Needed to maintain reasonable health and nutritional viability in patients whose degree of medical disability or risk requires that the dental care be provided within the hospital,

(4) Needed to maintain reasonable health, nutritional viability and quality of life in long-term patients (over 100 days of hospitalization).

d. The results of the dental examination will be recorded on VA Form 10-7978f or other approved oral exam record. The patient's primary care physician will be advised of the dental findings and the dental recommendations regarding patient management via telephone and/or a note written in the chart summarizing the findings and recommendations and requesting countersignature of the dental treatment plan.

5. Wherever and whenever feasible, there should be active participation in Orthopedic Service Treatment Planning Conferences by a designated member of the Dental Service. For instance:

a. The dentist(s) treating orthopedic patients should attend the Orthopedic Service Treatment Planning Conference when protocol patients are being presented.

b. A dental evaluation and tentative treatment plan should be available for each protocol patient presented. The patient's dental needs will be correlated with the increased risks of dental infection and bacteremia to hold delays to a minimum, decrease risks, and reduce potential morbidity which might result from uncoordinated treatment.

6. The following considerations are required prior to initiation of dental care:

a. An inpatient's current orthopedic status including history, symptoms, diagnosis, physical examination, current labs, special studies, current medications, and the recommendations of the primary care physician should be fully documented prior to dental treatment. Only in a life threatening hemorrhage or airway obstruction will care be provided without prior consultation with the primary care physician.

b. Stable (long-term S/P (status/post)joint placement) outpatients with acute dental emergencies (pain, infection, trauma) may be managed prior to consultation. Only the minimum intervention required to control the acute situation will be applied. The safety and well-being of the patient will receive the highest priority. Any further treatment of the patient's dental needs will be deferred until the primary care physician can be consulted.

c. If the patient is to be hospitalized for dental treatment, the following criteria will usually be applied:

(1) If the primary indication for the hospitalization is the status of the orthopedic prosthesis, the patient will be admitted to Orthopedic Service, with Dental Service consulting.

(2) If the primary indication for hospitalization is the dental problem, the patient will be admitted to the Dental Service, with Orthopedic Service consulting.

7. Coordination of treatment is a joint responsibility of the dentist and the primary care physician and will be guided by the following:

a. Coordination of the dental treatment with the orthopedic regimen will promote safe, expeditious management of the patient.

b. The timing and sequencing of dental and orthopedic care are critical for patients awaiting orthopedic implants. When feasible, dental care should be completed before the surgery so as to minimize risk of hematogenous septic involvement of the prosthesis.

c. Any necessary restrictions, adjustments of medications, and dental implications of the management of the patient's orthopedic problem will be coordinated via direct or telephone contact between the treating dentist and the primary care physician.

d. The primary care physician will be informed of any significant modifications in the delivery of dental care.

(c) **Management Guidelines.** The following information is provided primarily for dentist members of the medical staff to serve as guidelines in considering and delivering dental care to patients with orthopedic prostheses:

1. **Major Joint Procedures**

a. Dental care for patients awaiting prosthetic surgery must be designed to eliminate dental infection, to reduce potential for future dental sepsis, and to minimize the need for invasive dental treatment after implantation. In all cases, dental therapy should be completed expeditiously and, if possible, before the orthopedic surgery is done. Dental care should be administered in a concentrated fashion to reduce the number of exposures to treatment related bacteremias.

b. Infection is the chief complication of total joint replacement. Prostheses are either metal or combinations of metal and other osseointegrated materials held in place with a cement of methyl methacrylate. The cement reduces normal vascularity, hence the patient's body has difficulty combatting infections at the interface of bone and the prosthesis. Many orthopedic surgeons feel that antibiotic prophylaxis is needed for patients with joint replacements before they receive dental treatment that could lead to a transient bacteremia. Antibiotic protocols for these patients should be developed locally to the satisfaction of all involved Services. Staphylococcus aureus is responsible for the majority of infections in major joint replacements. Although the mouth flora is primarily streptococci and anerobic, specific regimens should include an anti-staphylococcal agent, e.g., penicillinase-resistant penicillin, cephalosporins, clavulanate potassium plus ticarcillin or amoxicillin. Vancomycin should be used for patients with serious penicillin and/or cehpalosporin allergy. Many orthopedic surgeons recommend the use of cephalosporins as the most effective antibiotic against staphylococci. One such regimen uses a first generation cephalosporin such as Keflex, 1 to 2 g. P.O. or I.M. 1 to 2 hours before dental treatment, followed after treatment by 1 g. P.O. every 4 hours for 3 doses.

2. Orthopedic Implants and TMJ Prostheses. The integrity of bone plates, pins, nails, screws, or other non-joint orthopedic prostheses is generally at a lower risk during dental procedures. If the need for prophylaxis is unclear, the primary care physician should be consulted prior to delivery of dental care. Patients receiving TMJ prostheses should have all oral sepsis eliminated prior to surgery whenever possible. This would greatly reduce the possibility of immediate post-surgical infection at the implant site.

(d) **Followup.** Appropriate outpatient or followup appointments will be assured for all joint prosthesis protocol patients undergoing dental treatment. Followup contact with the patient's primary care physician is also advised.

REFERENCES

1. Cioffi, G.A., Terezhalmy, G.T., Taybos, G.M.: Total Joint Replacement: A Consideration for Antimicrobial Prophylaxis. Oral Surg Oral Med Oral Path, 1988 July 1966(1): 124-9.

2. Eskinazi, D., Rathbun, W.: Is Systemic Antimicrobial Prophylaxis Justified in Dental Patients with Prosthetic Joints? Oral Surg Oral Med Oral Pathol 1988 Oct 66(4): 430.

3. Field, E.A. and Marin, M.V.: Is Antibiotic Prophylaxis Required for Dental Patients with Joint Replacements? Br Dent J 1985 Aug 24:159(4):102-3.

4. Hardie, J.: Report on Prosthetic Joints-Antibiotic Prophylaxis and Dental Treatment. Can Dent Assoc J 1988 May 54 (5):355-7.

5. Heydemann, J.S. and Nelson, C.L.: Short-term Preventive Antibiotics. Clin Orthop April 1986; (205):184-7

6. Jacobson, J.J., Schweitzer, S., DePorter, D.J., Lee, J.J.: Chemoprophylaxis of Dental Patients with Prosthetic Joints: A Simulation Model. J Dent Educ 1988 (11):599-604, November 1952.

7. Jaspers, M.T. and Little, J.W.: Prophylactic Antibiotic Coverage in Patients with Total Arthroplasty: Current Practice. J Am Dent Assoc 1985 Dec, 111(6):943-8.

8. Little, J.W.: Is There a Need for Antibiotic Prophylaxis in Dental Patients with Prosthetic Joints? Oral Surg Oral Med Oral Pathol 1988 Oct, 66 (4):430.

9. McGowan, D.A. and Hendrey, M.L.: Is Antibiotic Prophylaxis Required for Dental Patients with Joint Replacements? Br Dent J 1985 May 11;158(9):336-8.

10. Maderazo, E.G., Judson, S., Pasternak, H.: Late Infections of Total Joint Prostheses. A Review and Recommendations for Prevention. Clin Orthop 1988 Apr,(229):131-42.

11. Norden, C.W.: Prevention of Bone and Joint Infections. Am J Med 1985 June 28, 78(6B):229-32.

12. Persson, U., Montgomery, F., Carlsson, A., Lindgren, B., Ahnfelt, L.: How Far Does Prophylaxis Against Infection in Total Joint Replacement Offset Its Cost? Br Med J (Clin Res) 1988 Jan 9, 296(6615):99-102.

13. Schutzer, S.F. and Harris, W.H.: Deep-wound Infection After Total Hip Replacement Under Contemporary Aseptic Conditions. J Bone Joint Surg (Am) 1988 Jun 70 (5):724-7.

14. Wilson, N.I., Dreghorn, C.R.: Costs of Prophylaxis for Joint Prosthesis. Br Med J (Clin Res) 1988 Feb 13, 296(6620):499.

e. Guidelines for Dental Involvement in the Management of Patients With Metabolic and Nutritional Disorders.

(1) **Background/Rationale.** Patients with metabolic and nutritional disorders have impaired homeostatic mechanisms and inadequate stores of available cellular metabolites and nutrients. Dental and other intraoral infections, too often overlooked in medical work-ups, may further complicate the metabolic balance(s) upset by the basic disease process. Dental care, in addition to eliminating infections, can ensure a patient's ability to adequately masticate and begin digestion of a varied and nutritious diet, and must be considered an essential component of treatment for a number of disease entities in this group. From another point of view, poor wound healing, decreased host resistance, adverse drug reactions, and acute exacerbations of chronic conditions may occur in nutritionally or metabolically compromised patients and affect the progress and outcome of dental disease and its treatment. Rendering dental treatment on patients without consideration and evaluation of their medical status is associated with the potential for unfavorable outcomes.

(2) **Protocol Recommendations**

(a) **Responsibilities**

1. All members of the medical staff involved in the primary care of patients with nutritional and metabolic disorders must assure that, through routine examination or consultation referral, those patients have the opportunity to be evaluated by the Dental Service.

2. Examining dentists are responsible for identification and evaluation of oral problems and, with the primary care physician, for assessing the correlation of those problems (or treatment thereof) with the nutritional or metabolic disorder.

3. The Chief, Dental Service, or designee, is responsible for determinations regarding eligibility, prioritization and extent of care, as well as the overall supervision of the dental component of treatment.

4. Each treating dentist is responsible for the dental management of patients assigned, coordination with the primary care physician, and the actual delivery of dental care.

(b) **Procedures**

(1) Patients with the following disorders will be identified as protocol patients:

a. Diabetes mellitus

b. Parathyroid disorders

c. Thyroid disorders:

(1) Thyrotoxicosis.

(2) Hypothyroidism

d. Pheochromocytoma.

e. Malabsorption syndrome.

f. Pituitary disorders.

g. Gastrointestinal disorders

h. Malnutrition syndromes

i. Adrenal disorders

2. The following mechanisms will be used by the Dental Service to identify patients with nutritional and metabolic disorders:

a. Observation of oral and paraoral symptomology during Dental Service examinations.

b. Review of medical history and findings conducted at the time of oral examination of inpatients and of eligible outpatients undergoing elective or emergent care in the dental clinic.

c. Consultation requests from appropriate services or clinics; i.e., Medicine, Endocrinology, Geriatrics, etc.

3. Retrospective review of the daily G&L sheets for admitting diagnoses and review of daily special procedures or special clinics schedules may be used as quality assurance measures.

4. Completion of a comprehensive dental evaluation and formulation of specific treatment recommendations will be guided by the following:

a. A comprehensive examination and specific treatment recommendations should be completed within 24 hours following identification of a protocol patient. A summary of the dental findings and treatment recommendations will be provided either as a progress note or as a consultation response.

b. Dental treatment recommendations will be formulated according to acceptable dental practice with specific consideration for the patient's medical status, risk factors, restrictions, limitations, level of compensation, and prognosis. Patients must be judged individually on the basis of the nature and degree of disability relative to the contemplated dental procedure. In this category, for instance, a dental problem may complicate the medical condition, and its resolution becomes an integral, necessary part of the medical treatment. Conversely, the patient's medical condition may be such that it must be monitored by a physician during any period in which dental treatment ensues. In this category, for instance, a patient with well-controlled diabetes should be able to see a private dentist or be treated on an outpatient basis for most dental procedures. However, a patient with poorly controlled diabetes and on insulin may require the benefit of a hospital milieu and a hospital trained dentist to reduce the risks involved with needed dental care.

c. Unless the veteran has statutory entitlement to comprehensive outpatient dental care, the dental treatment provided to VA inpatients will be limited to that which is:

(1) professionally defensible as essential to the treatment of their medical problem(s),

(2) emergent (pain, trauma, hemorrhage or acute infection),

(3) needed to maintain health and nutritional viability in patients whose degree of medical disability or risk requires that dental care be provided within the hospital,

(4) needed to maintain reasonable health, nutritional viability and quality of life in long term patients (over 100 days of hospitalization).

d. Dental findings and treatment recommendations will be recorded on VA Form 10-7978f or other approved oral exam forms. The patient's primary care physician will be advised of the dental findings and the dental recommendations regarding patient management via telephone and/or a progress note written in the chart summarizing the findings and recommendations. Counter-signature of the dental treatment plan will be requested.

5. Whenever feasible, there should be active participation in ward treatment planning conferences by a designated member of the Dental Service. A dental evaluation and tentative treatment plan will be prepared for each patient presented. The patient's dental needs will be correlated with the overall treatment plan to hold delays to a minimum, decrease risks, and reduce potential morbidity which might result from uncoordinated treatment.

6. The following considerations by a treating dentist are required prior to initiation of care:

a. For inpatients, a current medical status including history, symptoms, diagnosis, physical examination, current labs, special studies, current medications, and the recommendations of the primary care physician will be fully documented prior to dental treatment. It is imperative that the primary care physician is briefed on the type and extent of dental treatment planned and any anticipated complications so that proper coordination with the patient's therapeutic plan is accomplished.

b. Protocol outpatients that are medically stabilized and present with acute dental pain or infection may be managed prior to physician consultation. Only the minimum intervention required to control the acute situation will be provided. The safety and well-being of the patient will receive the highest priority. Any further treatment of the patient's dental needs will be deferred until the primary care physician can be consulted.

c. If the patient is to be hospitalized for dental treatment, the following criteria will usually be applied:

(1) If the primary indication for the hospitalization is the medical status, the patient will be admitted to the Medical Service, with Dental Service consulting.

(2) If the primary indication for the hospitalization is the dental problem, the patient will be admitted to the Dental Service, with Medical Service consulting.

7. Coordination of treatment is a joint responsibility of the treating dentist and the primary care physician, and will be guided by the following:

a. The timing and sequencing of dental and medical treatment are often critical for high risk patients, e.g., dental treatment sequenced to medication requirements, time of day and length of appointment.

b. Special restrictions, adjustments of medication, and dental implications of the management of the patient's medical condition will be coordinated with the primary care physician via direct contact or telephone.

c. Modifications in the delivery of dental care will be the responsibility of the treating dentist following consultation with the primary care physician.

8. Vital signs will be recorded for all such patients before and after each dental treatment appointment.

(c) **Management Guidelines.** The following information is provided primarily for the dentist members of the medical staff to serve as guidelines in considering and delivering dental care to patients with various diagnoses in this grouping.

1. **Diabetes Mellitus**

a. Although dental management of most diabetic patients is relatively uncomplicated, the disease and its medical treatment is complex. It is imperative that treating dentists not only review the biological bases involved in the disease process, but also be aware of current medical treatment strategies and regimens.

b. Patients with juvenile onset, ketosis prone (Type I) diabetes produce no insulin. They are totally dependent upon a balance of exogenous insulin, nutritional intake, and metabolic demand. A history of multiple admissions for diabetic ketoacidosis is often present. Dental treatment beyond simple preventive or restorative care should be coordinated with the primary care physician. Close monitoring of the levels of serum glucose is necessary. Any dental procedure that interferes with the patient's ability to maintain the prescribed dietary intake should be coordinated with the patient's primary care physician. Infections (including those of dental origin), stress and extensive procedures requiring lengthy chairtime may alter the patient's insulin requirements and should be discussed with the patient's physician.

c. Patients with adult onset, non-ketosis prone (Type II) diabetes manifest decreased amounts of insulin, insulin with decreased activity, or delayed insulin secretion. Control requirements are usually less stringent, admissions for shock or coma are infrequent, and insulin and carbohydrate regimens do not have to be altered frequently.

d. The regimen that the patient follows to control diabetes may provide clues to the complexity of the disease and may indicate whether dental treatment is likely to necessitate a change in that regimen. A urine screen for sugar and acetone should be performed before each treatment visit. Urine sugars greater than 2+ should be followed by blood sugar determinations. Blood sugar greater than 250 mg percent represents poor control and medical consultation is indicated. Evaluation and treatment considerations depend upon the type and extent of disease.

(1) **Diet Control Only.** Levels of blood sugar are controlled by restricting carbohydrate intake. Usually no modifications of dental treatment are necessary. Screen for sugar/acetone before treatment.

(2) **Oral hypoglycemics.** Usually reserved for patients who are unable to be controlled on diet alone. Screen urine for sugar/acetone prior to treatment. If dental treatment will interfere with nutritional intake, have patient skip the medication that day. Restart medication when oral intake is assured. The patient is generally not at risk from hyperglycemia for several days under those conditions.

(3) **NPH (Neutral Protamine Hagedorn).** Usually self-injected by patients who require exogenous insulin to control blood sugar. The onset of effect of NPH insulin is approximately 1 to 2 hours with a peak activity at 6 to 12 hours and a total duration of 18

to 24 hours. Blood sugar is usually tested at 4 p.m. and should reflect peak activity. If dental treatment will interfere with nutritional intake, the usual dose of NPH insulin should be decreased, typically by 1/2, or in some instances the entire dose may be withheld. This should be coordinated with the responsible physician. The regular regimen is resumed when nutritional intake is back on usual schedule. If necessary, because of general anesthesia or uncertain response to treatment, the NPH insulin may be withheld in some instances in favor of regulation with regular insulin, based on levels of blood sugars. Appointments should be scheduled in A.M. to avoid peak activity levels of insulin.

(4) **Regular Insulin.** Patients who take regular insulin, either alone or in combination with NPH, generally require finer control of the blood sugar. The onset of activity of regular insulin is 1 to 2 hours, with a peak at 2 to 4 hours, and a duration of 6 to 8 hours. Regular insulin may be used following treatment during the interval when nutritional intake will be uncertain. Dosage adjustments must be coordinated with the patient's primary-care physician.

(5) **Diabetic Diet.** The diabetic patient will be on a regulated diet. Caloric intake will usually vary between 1600 and 2400 calories. Weight reduction diets of 1,200 to 1,400 calories may be used until weight is stabilized at or near ideal levels. For those on insulin, caloric intake should not be altered without appropriate adjustment of the medications.

(6) **Rainbow or Sliding Scale Coverage.** Regular insulin coverage for posttreatment patients may vary from center to center. Blood sampling via the fingerstick method is screened in the morning upon rising and before meals with administration of regular insulin as indicated. Below is a typical sliding scale coverage, based on accucheck blood samples.

* Serum Glucose	Regular Insulin
200	0 Units
200–250	2 Units
250–300	5 Units
300 +	10 Units

* These values are relative guidelines and are adjusted according to patient's response and body habitus.

e. Well-controlled diabetics generally do not require prophylatic antibiotics. However, leukocyte phagocytosis is decreased by an elevated blood sugar and microvascular changes in diabetes may make the poorly controlled diabetic more susceptible to infection. Prophylactic antibiotics should be considered in those instances.

f. Hyperosmolar coma (diabetic coma) develops gradually over a period of several days when carbohydrate intake is excessive or insulin administration is inadequate. Insulin shock can develop within 20 to 30 minutes when carbohydrate intake has been inadequate or insulin administration has been excessive. Differentiation of diabetic coma from insulin shock should be based on the clinical and historical findings and treated appropriately.

2. **Parathyroid Disorders.** Patients with parathyroid disorders are at risk of hypercalcemia or hypocalcemia. Dental treatment should be undertaken only after serum calcium levels have been stabilized by the primary care physician.

3. **Thyroid Disorders**

a. Risks of thyroid storm in hyperthyroidism, and myxedema coma in hypothyroidism mandate that patients with thyroid disorders receive careful evaluation by the primary care physician prior to dental care.

b. In thyrotoxicosis, increased thyroid activity is associated with excess production of principal hormones T3 (triiodothyronine) and T4 (thyroxine). Nervousness, irritability, insomnia, intolerance to heat, increased sweating, overactivity, weight loss, and rapid speech are seen. Clinical signs include increased blood pressure, widened pulse pressure, tachycardia, extreme sweating, warm moist skin, tremulousness and exophthalmos (Grave's disease). The cardiovascular symptoms may progress to arrhythmias, congestive failure and pulmonary edema. In an untreated or unstabilized patient, stress or the use of atropine or epinephrine can precipitate a lifethreatening "thyroid storm" characterized by high fever, severe agitation, disorientation, delerium, stupor and coma.

c. In hypothyroidism, the supply of thyroid hormones is decreased. Hypothyroid patients are unusually sensitive to sedatives, narcotics, and tranquilizers. Clinical manifestations include an enlarged tongue with atrophic papillae and thick, edematous skin with puffy hands and face. The skin is dry and perspiration is absent. Blood pressure is usually normal and the heart rate is slow. Mental apathy, drowsiness, cold intolerance, and slow speech are also seen. Congestive heart failure with pulmonary edema may occur. Myxedema coma may develop with hypothermia, bradycardia, hypotension, and cerebral obtundation.

d. Hypothyroid patients as well as hyperthyroid patients who have been treated by surgery or radioactive ablation of the thyroid are usually maintained on thyroid replacements. Consultation with the primary care physician to verify that the patient is euthyroid should be obtained prior to dental treatment.

4. **Pheochromocytoma.** Patients with pheochromocytoma are at risk of cardiac arrhythmia, hypertensive crisis, and blood volume deficits. Medications used to control the blood pressure before and after removal of the tumor may contraindicate the use of epinephrine in local anesthetic and/or may alter the patient's ability to tolerate the stress of dental treatment.

5. **Pituitary Disorders.** Pituitary tumors are usually treated by surgery and/or by radiotherapy. Dental treatment can proceed if considerations for normal hormone levels, administration of perioperative steroids, and recognition of the radiation ports are undertaken.

6. **Nutritional Disorders.** Individuals may develop nutritional deficiencies:

a. As a result of an inadequate diet,

b. As the result of a condition interfering with absorption of ingested food, and

c. When diet and absorption are normal but other physical conditions increase nutritional demands.

Although the state of the dentition does not usually contribute directly to the malnourishment of the patient, dental restoration may facilitate the patient's recovery or ability to thrive by allowing oral intake of a diet that is interesting and palatable to the patient.

7. **Gastrointestinal Disorders.** A history of peptic ulcer disease, gastritis, or previous gastrectomy gives rise to several considerations prior to emergent or elective dental care. Patients may present with chronic or acute anemia secondary to GI blood loss. Laboratory evaluation via CBC (including a red blood cell count) is indicated. Most patients with a history of peptic ulcer disease must avoid aspirin and steroids because of the risk of gastric bleeding. Dental treatment may be considered essential for the treatment of many gastrointestinal disorders because of the assistance a functional dentition provides in predigestive preparation of the bolus by adequate mastication and lubrication.

8. **Adrenal Disorders.**

a. Risk of adrenal crisis requires that the primary care physician be consulted prior to providing dental treatment to patients with adrenal disorders or who are receiving (or have received) steroid therapy.

b. In hyperadrenalcorticism, whether of endogenous or exogenous (therapeutic) origin, there is decreased resistance to infection and increased loss of minerals from bones. These tendencies may manifest as an increased frequency and severity of periodontitis and other oral infections (e.g. periapical abscess, post-surgical infection, and mucosal candidiasis) and as more rapid atrophy of edentulous alveolar ridges. These problems can be minimized by the timely institution of dental care. Antibiotic coverage may be indicated.

c. The risk of adrenal crisis is based upon a reduced adrenal responsiveness to stress after long-term suppression of the pituitary-adrenal axis. As a general rule, patients receiving therapeutically prescribed corticosteroids are considered at risk if they have taken a homeopathic dosage (5 mg. prednisone, 20 mg hydrocortisone, or the equivalent, per day) or more for 2 weeks or longer. The risk remains for up to 1 year after cessation of the hyperadrenalcorticism, i.e., removal of a corticosteroid-producing adenoma or discontinuation of therapeutic administration, even when tapered down. For patients whose therapeutic dosage has not changed recently, the usual procedure is to administer twice the dose on the day of dental treatment. However, adjustments will be required for patients with hypoadrenalcorticism, or whose therapeutic dosage has recently changed. As the patient's recollection may be inaccurate, the dentist always should confer with the primary care physician before initiating dental treatment when the medical history suggests a risk of adrenal crisis.

d. In hyperaldosteronism, there is increased risk of a cardiovascular emergency during dental treatment. The risk relates to the difficulty in controlling hypertension (myocardial infarction, cerebrovascular accident) and hypokalemia (increased susceptibility to cardiac arrhythmia). The use of epinephrine with local anesthetics may be contraindicated. When hyperaldosteronism results in xerostomia, a caries prevention program is advised.

(d) **Followup.** Appropriate outpatient or followup appointments will be assured for all protocol patients undergoing dental treatment. Followup contact with the patient's primary care physician is also advised.

REFERENCE

1. Malamed, S.: Handbook OP Medical Emergencies in the Dental Office, 3rd Ed. 1986.

2. Little, J.W. and Falace, D.A.: Dental Management of the Medically Compromised Patient, 3rd Ed. 1988. The C.V. Mosby Co. St. Louis, MO, 1988.

3. Rose, Louis and Faye, Donald: Internal Medicine for Dentistry, C.V. Mosby Co. 1983.

4. Redmon, R.S.: Dental Aspects of Endocrinology, Chapter 207 in "Principles and Practice of Endocrinology and Metabolism," Becker, K.L. Editor, J.B. Lippincott Co, Philadelphia, PA., (In Press).

f. Guidelines for Dental Involvement in the Management of Patients With End-Stage Renal Disease

(1) Background/Rationale.

(a) Patients with end-stage renal disease have a profound impairment of excretory capacities and, without adequate management, may exhibit a wide range of fluid and electrolyte imbalances, hypertension, anemia, coagulation defects, and altered drug metabolism. A number of dental implications are apparent. Immunosuppressant therapy in preparation for and following kidney transplants make the control and/or avoidance of dental infection a necessary component of care. Patients dependent on renal hemodialysis are repeatedly anticoagulated and dentists must be aware of the potential for increased bleeding as a result of dental care. Inadequate pretreatment evaluation and treatment by the dentist without consideration for the patient's renal status and related problems are associated with an increased potential for morbidity. A-V shunts must be protected; concerns for osteoporosis must be recognized. The dental team must take precautions appropriate to the increased incidence of blood-borne viral diseases, particularly in the hemodialysis patients.

(b) Transient bacteremias from oral sources as well as reduced nutrition due to inadequate masticatory ability can adversely affect the patient with end-stage renal disease. The sequelae contribute negatively in terms of acute and chronic debilitation and morbidity. Therefore, the objectives of oral/dental care in these patients are:

1. The eradication and/or prevention of bacteremias of oral origin.

2. The establishment of masticatory function to the degree that allows the patient the opportunity for nutritional viability; realizing the special restrictive diets which these patients usually require.

3. The teaching of and providing of preventive oral/dental care is of utmost importance in these immunocompromised patients. Oral infections must be avoided through ongoing self-care and recurrent professional intervention.

(2) Protocol Recommendations

(a) Responsibilities

1. All members of the medical staff involved in the primary care of patients with end-stage renal disease must assure that, through routine examination or consultation referral, those patients have the opportunity to be evaluated by the Dental Service.

2. Examining dentists are responsible for the identification and evaluation of oral problems and, with the primary care physician, for assessing the correlation of those problems (or treatment thereof) with the renal condition.

3. The Chief, Dental Service, or designee, is responsible for determinations regarding eligibility, prioritization and extent of care, as well as the overall supervision of the dental component of treatment.

4. Each treating dentist is responsible for the dental management of patients assigned, coordination with the primary care physician, and the actual delivery of dental care.

(b) **Procedures**

1. Patients with the following renal problems will be identified as protocol patients:

a. CRF (Chronic renal failure)

b. Hemodialysis

c. CAPD (Continuous Ambulatory Peritoneal Dialysis)

d. Renal transplant

e. Nephrotic Syndrome

2. Dental Service will identify patients with end-stage renal disease through:

a. Review of medical history and findings conducted at the time of oral examination of inpatients and of eligible outpatients undergoing care in the dental clinic.

b. Consultation requests from appropriate services or clinics, i.e., Renal Service, Medicine, Hemodialysis, Geriatrics, etc.

3. Retrospective review of the daily G&L sheets for admitting diagnoses of renal disease and review of special procedures or hemodialysis schedules may be used as quality assurance measures.

4. Completion of a comprehensive dental evaluation and formulation of specific treatment recommendations will be guided by the following:

a. A comprehensive oral examination and specific treatment recommendations should be completed within 24 hours following identification of a protocol patient. A summary of the dental findings and treatment recommendations will be provided either as a progress note or as a consultation response.

b. Dental treatment recommendations will be formulated according to acceptable dental practice with specific consideration for the patient's renal status, risk factors, restrictions, limitations, level of renal compensation, and prognosis. Generally speaking, bacteremia-risk patients with renal disorders must be judged individually on the basis of the nature and degree of medical disability relative to the contemplated dental procedure.

c. Unless the veteran has statutory entitlement to comprehensive outpatient dental care, the dental treatment provided to VA inpatients will be limited to that which is:

(1) Professionally defensible as essential to the treatment of their medical problem,

(2) Emergent (pain, trauma, hemorrhage, or acute infection),

(3) Needed to maintain reasonable health and nutritional viability in patients whose degree of medical disability or risk requires that dental care be provided within the hospital,

(4) Needed to maintain reasonable health, nutritional viability and quality of life, in long-term patients (over 100 days of hospitalization).

d. Dental findings and treatment recommendations will be recorded on VA Form 10-7978f or other approved oral exam form. The patient's primary care physician will be advised of the dental findings and the dental recommendations regarding patient management via telephone and/or a progress note. A countersignature of the dental treatment plan will be requested.

5. Wherever and whenever feasible, there should be active participation in appropriate treatment planning conferences by a designated member of the Dental Service. A dental evaluation and tentative treatment plan will be prepared for each patient presented. The patient's dental needs will be correlated with the medical treatment plan to minimize delays, decrease risks, and reduce potential morbidity which might result from uncoordinated treatment.

6. The following considerations by a treating dentist are required prior to initiation of care:

a. For inpatients, a current renal status including history, symptoms, diagnosis, physical examination, current labs, special studies, current medications, and the recommendations of the primary care physician will be fully documented prior to dental treatment. It is imperative that the primary care physician is briefed on the type and extent of dental treatment planned and any anticipated complications so that proper coordination with the patient's therapeutic plan is accomplished.

b. Stable renal disease outpatients with acute dental pain or infection may be managed prior to physician consultation. Only the minimum intervention required to control the acute situation will be provided. The safety and well-being of the patient will receive the highest priority. Any further treatment of the patient's dental needs will be deferred until the primary care physician can be consulted.

c. If the patient is to be hospitalized for dental treatment, the following criteria will usually be applied:

(1) If the primary indication for the hospitalization is the renal status, the patient will be admitted to the Medical or Surgical Service, as appropriate, with Dental Service consulting.

(2) If the primary indication for the hospitalization is the dental problem, the patient will be admitted to the Dental Service, with Medical or Surgical Service consulting.

7. Coordination of treatment is a joint responsibility of the dentist and the primary care physician, and will be guided by the following:

a. The timing and sequencing of dental and medical treatment are critical for certain renal patients; e.g., dental treatment for hemodialysis patients should generally not be administered on hemodialysis days.

b. Special restrictions, adjustments of medication, and dental implications related to the management of the patient's renal condition will be coordinated with the primary care physician via direct contact or telephone.

c. The treating dentist will coordinate any major modifications in the delivery of dental treatment with the primary care physician.

(c) **Management Guidelines.** The following information is provided primarily for the dentist members of the medical staff to serve as guidelines in considering and delivering dental care to patients with various renal diagnoses:

1. **CRF (Chronic Renal Failure)**

a. Patients with CRF demonstrate excretory problems, hematologic changes, bleeding tendencies, hypertension, and fluid and electrolyte imbalances.

b. Renal dysfunction causes retention of nitrogenous metabolic by-products; i.e., urea and creatinine. Assessment of the levels of BUN (blood urea nitrogen) and creatinine permits an estimation of the degree of kidney dysfunction.

c. BUN is not the preferred method to assess renal function since the level of urea in the serum, in addition to kidney activity, depends upon dietary protein intake, liver function, and the hydration of the patient. However, the degree of azotemia (elevated BUN) correlates better with coagulation problems than does the level of the serum creatinine.

d. Serum creatinine and the creatinine clearance provide better estimations of the patient's renal status. Creatinine is a by-product of muscle metabolism. The levels of creatinine contained in a 24-hour urine sample (creatinine clearance) most accurately represents renal function.

e. Normal BUN levels are 10 to 20 mg percent (mg per 100 ml of blood). BUN greater than 20 mg percent is termed azotemia. Normal serum creatinine values are 0.5 to 1.5 mg per L. However, in elderly persons, renal function may be abnormal despite a normal serum creatinine. This is due to reduced muscle mass with aging. Normal creatinine clearance for such patients is approximately 125 ml/min or 180 L/day.

f. Patients with CRF who are not on dialysis will have prolonged metabolism and half-life of any drug excreted by the kidney. Appropriate adjustments of all such medications is indicated to prevent toxic reactions.

g. Patients with CRF often demonstrate a decreased red cell mass. The anemia is chronic and compensatory changes have usually occurred. Patients with hematocrits greater than 20 percent generally do not require elective transfusion.

h. Patients with decreased glomerular filtration rates have defective platelet aggregation with a prolongation of the Ivy bleeding time. Even patients who are adequately dialyzed can develop bleeding tendencies secondary to platelet deficiencies when subjected to physiologically stressful conditions.

i. Hypertension is a primary cause of renal failure in a large number of cases. Conversely, renal failure may cause hypertension due to fluid retention. Blood pressure determinations prior to dental procedures are necessary for these patients. Referral for normalization of the blood pressure is indicated if abnormal readings are obtained.

j. Volume overload or depletion, sodium excess or deficiency, depressed serum bicarbonate, hyperkalemia, hypocalcemia, and abnormal phosphate concentrations should be addressed by the primary care physician prior to dental care.

2. Hemodialysis

a. Patients are generally hemodialyzed according to a regular schedule, usually on alternate days. Prior to hemodialysis, patients are heparinized to prevent blood clotting during the procedure. Elective dental treatment should not be administered on the days of hemodialysis. Dental treatment can usually be performed without risk of increased bleeding on non-dialysis days because of the approximate 6-hour half-life of heparin.

b. Hemodialysis patients have A-V shunts or fistulas to facilitate hemodialysis. The arm containing the shunt should not be used for obtaining blood pressures, for venipunctures or for administration of medications.

c. Theoretically, passage of the patient's white blood cells through the hemodialysis machine impairs their function. In addition, the A-V shunt may be at risk of infection from transient bacteremias during or following dental manipulations. Appropriate antibiotic prophylaxis is generally recommended. The American Heart Association Standard Regimen is probably adequate, but the primary care physician may suggest an alternate regimen. Reduced dosages are not recommended

d. Many hemodialysis patients demonstrate renal osteodystrophy. Those who suffer fractures (including those of the maxillofacial complex) may require treatment of calcium deficiency or aluminum toxicity to enhance fracture healing of their partially demineralized bones.

e. Shared use of hemodialysis machines and the need for frequent blood transfusions places all hemodialysis patients at increased risk for blood-borne infections, especially Hepatitis B and Non-A, Non-B hepatitis and AIDS. As with all other dental patients, universal precautions must be exercised.

3. CAPD (Continuous Ambulatory Peritoneal Dialysis)

a. As with other end-stage renal disease patients, those receiving CAPD are immunocompromised and therefore prone to development of infections. Preventive dental procedures, both professional and self-care, are necessary to avoid infections of oral origin.

b. Patients undergoing CAPD exchange containers of dialysate three or four times a day. Adjustments to dental appointments may be needed to accommodate these exchanges.

c. Antibiotic prophylaxis is usually not indicated for patients undergoing CAPD.

4. Renal Transplants

a. Patients who are being prepared to receive (or have received) renal transplants are always immunosuppressed. Early signs or symptoms of infection may be masked. A CBC (to assess RBC (red blood cell) and WBC (white blood cell) counts), antibiotic coverage, and steroid coverage may be indicated. Consultation with the primary care physician is mandatory prior to initial dental care.

5. **Nephrotic Syndrome**

These patients present a varied array of symptoms, stages, compromising deficits and clinical management problems. Because of the individual variability of presentation consultation with the primary care physician for each of these patients is indicated as an integral part of dental treatment planning.

(d) **Followup.** Appropriate outpatient or followup appointments will be assured for all end-stage renal protocol patients undergoing dental treatment. Followup contact with the patient's primary care physician may also be advised.

REFERENCES

1. Brenner, B.M. and Rector, F.C.: The Kidney, W.B. Saunders Co., Philadelphia, PA, 1986, pp. 567-579 and 1680-1683.

2. Rose, L.F. and Kaye, D.: Internal Medicine for Dentistry, The C.V. Mosby Co, St. Louis, MO, 1983, pp. 558-671.

3. Little, J.W. and Falace, D.A.: Dental Management of the Medically Compromised Patient, 3rd Edition. The C.V. Mosby Co., St. Louis, MO, 1988, pp. 208-219.

4. Sonis, S.T. and Fazio, L.: Principles and Practices of Oral Medicine, W.B. Saunders Co., Philadelphia, PA, 1984, pp. 359-376.

5. Friedman, J.R., Norman, D.C., Yoshikawa, T.T.: Correlation of Estimated Renal Function Parameters Versus 24 Hour Creatinine Clearance in Ambulatory Elderly. J. Am. Geriatric Soc. 37: 145-149, 1989.

g. **Guidelines for Dental Involvement in the Management of Immunocompromised Patients**

(1) **Background/Rationale**

(a) Immunocompromised patients may have a primary immunodeficiency disease or have a secondary deficiency due to an underlying disease or therapeutic regimen. Most primary immunodeficiency diseases are congenital. Secondary deficiencies may result from diseases such as AIDS (Acquired Immune Deficiency Syndrome), ARC (AIDS Related Complex), leukemia, and multiple myeloma, or from medication such as cancer chemotherapeutic agents and long-term corticosteroids. Immunocompromised patients have decreased tolerance for infection, may be myelosuppressed, and may have impaired healing potential. These patients require strict control of any existing pathological oral condition, and preventive measures must be instituted to minimize patient morbidity from opportunistic oral/dental disease.

(b) Pretreatment evaluation and treatment planning is indicated in any situation where the patient will be immunocompromised by a therapeutic modality. Timing of treatment must be coordinated with the primary care physician, and oncologist or hematologist. Follow-up is necessary for optimal care throughout (and usually after) the course of treatment.

(c) Patients with primary and secondary immunodeficiency diseases must have dental intervention as early as possible in the course of their disease in order for proper oral therapeutic and preventive measures to be instituted.

(d) Dental Service staff members with upper respiratory infections or with dermatitis should not be allowed to treat immunocompromised patients unless appropriate infection control measures are utilized (including full surgical gown, cap, mask, etc.)

(2) Protocol Recommendations

(a) Responsibilities

1. All members of the medical staff involved in the primary care of immunocompromised patients must assure that, through routine examination or consultation referral, all patients have the opportunity to be evaluated by the Dental Service.

2. In conjunction with the patient's primary care physician, the examining dentist is responsible for the identification and evaluation of oral/dental problems, and for correlating those problems and the proposed dental treatment with the immunocompromised condition in conjunction with the patient's primary care physician.

3. The Chief, Dental Service, or designee, is responsible for determinations regarding eligibility, prioritization, and extent of care, as well as the overall supervision of the dental component of treatment.

4. Each treating dentist is responsible for the oral/dental management of assigned immunocompromised patients, coordination of care (extent and timing) with the primary care physician, and the actual delivery of care.

(b) Procedures

The following patients will be identified in this protocol:

1. Patients receiving cancer chemotherapeutic agents.

2. Patients with opportunistic infections.

3. Patients on immunosuppressant therapy for organ transplants.

4. Patients who are immunosuppressed as the result of chronic or multi-system disease, and severely debilitated patients.

5. Patients with AIDS (Acquired Immune Deficiency Syndrome) or other stigmata of HIV infection.

6. Patients receiving any other immunosuppressant medication (such as long-term steroids) or treatment that results in bone marrow depression, as determined by a review of the patient's medication profile.

(c) Management Guidelines

1. Chemotherapy for Cancer Patients

a. Cancer chemotherapy is frequently used as a primary treatment modality or as an adjuvant for the management of disseminated malignancy, solid tumors, lymphomas, and leukemias. Many tumoricidal drugs are cytotoxic to normal tissue and produce leukopenia, anemia, and thrombocytopenia. Patients receiving cancer chemotherapy are

prone to infection, hemorrhage, and delayed healing, which is also true of patients whose malignancies directly result in immunosuppression and myelosuppression.

b. Only the minimally necessary treatment should be provided to control acute oral/dental problems that occur during episodes of immunosuppression and myelosuppression secondary to cancer chemotherapy. Hematology laboratory tests (e.g., hemoglobin, white blood count, differential, and platelet count) must be done and the patient's primary care physician consulted just prior to planned oral/dental treatment. Transfusion of appropriate blood products may be considered when significant deficiencies are noted in the laboratory tests and there is an emergency (acute infection, pain, trauma, hemorrhage). Such precautions are also applicable to patients whose malignancies are directly responsible for immunosuppression and myelosuppression.

c. Needed, non-emergency oral/dental care may be provided to stable cancer chemotherapy patients between chemotherapy cycles when the patient is not immunosuppressed or myelosuppressed. Generally, such treatment should be performed before the beginning of the next chemotherapy cycle. Hematology laboratory tests must be done and the patients primary care physician consulted prior to planned treatment. The granulocyte count should be greater than 1000/mm3 (or a figure agreed to by the physician) for such non-emergent treatment.

d. Carefully planned operative and hemostatic techniques, with consideration to tissue handling and primary closure, should be employed to reduce the degree of bacteremia and hemorrhage during surgical procedures.

e. Immunosuppressed patients are at risk for exacerbation of mild or chronic oral/dental infections (e.g., gingivitis, periodontitis, and chronic periapical pathology) into acute, fulminating infections which can be extremely serious. Therefore, all existing acute and chronic oral/dental infection, and all potential sources of infection should be eliminated prior to the beginning of cancer chemotherapy. It is important to note that the usual clinical signs of inflammation may be minimal in immunosuppressed patients.

f. The oral cavity is the site of significant adverse effects of cancer chemotherapeutic agents. Mucositis, ulcerative stomatitis, non-specific gingival inflammation, and xerostomia result from toxic effects of the agents on oral mucosal and salivary tissue. Oral opportunistic infections of bacterial, fungal, and viral etiology, and hemorrhage result indirectly from the immunosuppressive and myelosuppressive activities of these agents. Frequent evaluation, meticulous oral hygiene, symptomatic support, and aggressive preventive intervention should be performed in consultation with the primary care physician.

g. Pain resulting from the side effects of cancer chemotherapy, particularly mucositis and ulcerative stomatitis, may interfere with the patient's ability to eat and nutrition may be thus compromised. Meticulous oral hygiene and frequent saline or sodium bicarbonate/water rinses should be used to reduce oral bacterial levels and thus reduce secondary infection of oral lesions. Topical anesthetics should be prescribed to maintain patient comfort, particularly in preparation for eating and oral hygiene procedures. Dyclonine hydrochloride 0.5 percent, viscous xylocaine 2 percent, and diphenhydramine/milk of magnesia suspension can be applied to painful lesions or used as oral rinses. Topical anesthetics should be in contact with mucosa for 5 to 7 minutes for maximum effect. Some patients with severe pain may require systemic analgesics or narcotics when topical preparations do not control the pain.

h. Secondary infections of mucosa compromised by inflammation or ulceration can be prevented by meticulous oral hygiene, including toothbrushing, frequent oral saline rinses, and topical application of antimicrobial agents such as Peridex (0.12 percent chlorhexidine gluconate) or 1 percent povidone iodine solution three times a day. Invasion of mucosa resulting in local infection or septicemia are frequent complications of chemotherapy and must be detected early and aggressively managed. When local infection of septicemia occur, repeated bacterial cultures and sensitivity testing are indicated to identify the organisms and determine appropriate antibiotic therapy.

2. Opportunistic infections

a. Opportunistic mycotic infections, such as Candida albicans, are common when the oral environment is altered or the patient is debilitated. Aspergillosis, mucormycosis and other fungal infections may also occur in compromised patients. For localized oral candidiasis, topical therapy may be used with clotrimazole (10 mg troches) five times a day, or nystatin tablets (100,000 units) dissolved slowly in the mouth four times a day for 1 to 2 weeks in the acute phase, followed by three tablets daily for 1 to 2 weeks, and then one to two tablets daily as a maintenance dose. For widespread oral, esophageal, or systemic fungal infection, systemic therapy should be used. In any case, the primary care physician should be consulted regarding the antifungal therapy. In edentulous patients with dentures, it is important that the fungal organisms on the dentures are destroyed by soaking the dentures for 5 minutes three times a day in a 1:10 dilution of 5.15 percent sodium hypochlorite solution (household bleach) in water. Patients with angular cheilitis must also be treated with an antifungal cream, such as clotrimazole cream or nystatin cream.

b. Viral infections such as herpes simplex and varicella/zoster may appear as primary infections or recurrent episodes which may produce severe mucositis and ulceration. Palliative and prophylactic measures include avoiding exposure to known viral carriers and treatment with antiviral agents after consultation with the patient's physician.

3. Patients Receiving Immunosuppressive Drugs for Organ Transplants

a. Patients who are being prepared for or have received organ transplants (e.g., kidney, heart, bone marrow, liver) are subjected to immunosuppressive therapy with drugs such as Imuran, cyclosporine, and prednisone to prevent rejection of the transplanted organ. These drugs also suppress the patient's resistance to infection.

b. Immediately following transplantation or following an acute rejection episode, patients may be on high dose steroid therapy. The dose is then gradually tapered to a maintenance dose (e.g., prednisone 15 mg daily or every other day) over a period of weeks. During periods when the steroid dose exceeds the maintenance level, only emergency or urgent oral/dental treatment should be provided. Routine care should be deferred until the maintenance dose is reached and the patient is considered to be stable. The steroid dose should not be altered nor should steroid prophylaxis be provided without consulting the patient's primary care transplant physician.

c. Patients requiring organ transplantation should be referred to and evaluated by the Dental Service prior to transplantation. All existing sources and all potential sources of oral/dental infection should be eliminated. To the extent possible, all needed care should be completed prior to the transplant surgery. Appropriate antibiotic prophylaxis may be

required for the dental procedures depending on the patient's underlying medical condition.

d. If immunosuppressed post-transplant patients require oral/dental care, they must receive antibiotic prophylaxis. The patient's primary care transplant physician should be consulted regarding the drug(s) used and dosage. While practices vary, the American Heart Association guidelines may be useful.

e. Meticulous oral hygiene and close follow-up of post-transplantation patients is necessary to prevent oral/dental disease and infection, and the resulting potential for systemic complications.

4. **Patients with Multi-System Disease**

a. Elderly patients with multi-system disease and patients who are severely medically compromised are generally more susceptible to the complications of oral/dental disease, have decreased resistance to infection and its sequelae, and are less able to tolerate intra/oral changes.

b. The incidence and severity of acute and chronic oral/dental disease in patients with multi-system disease can be reduced by:

(1) Early diagnosis and treatment of oral/dental problems;

(2) Preventive care and periodic reinforcement of oral hygiene;

(3) Periodic reexamination and treatment when needed.

c. The use of chronic mucosal irritants such as tobacco, alcohol, irritating mouthwashes, and caustic foods, should be eliminated or reduced.

d. Oral/dental conditions which predispose the debilitated patient to infection or soft tissue trauma should be treated. These conditions include xerostomia, dental caries, periodontal disease, and ill-fitting dentures. The dentition should be examined carefully for root caries. Treatment planning should consider modifications of oral hygiene procedures when necessary, oral rinses (saline, chlorhexidine gluconate, etc.), saliva substitutes, and elimination of poorly fitting dental prostheses.

e. Elderly and debilitated patients, particularly with multi-system disease, are often taking multiple medications. Intake and metabolism of medications are often altered due to chronic disease and/or poor absorption from the GI tract. As a result, the dentist must be alert to the increased likelihood of drug interactions and the potential for altered absorption and metabolism in prescribing antibiotics and other medications.

5. **AIDS (Acquired Immune Deficiency Syndrome)**

a. Patients newly diagnosed as being HIV positive, or having AIDS or ARC (AIDS Related Complex) should be referred to the Dental Service by the primary care physician or Infectious Disease section of the Medical Service for an evaluation. In addition, these patients should be seen whenever there is an apparent change in their oral health status.

b. All existing acute and chronic infection, as well as all potential sources of infection, should be eliminated. Gingivitis and periodontal disease should be aggressively treated to prevent the rapid form of periodontal destruction which often occurs in these patients.

c. Opportunistic infection in the oral cavity can be the first sign of HIV infection in asymptomatic individuals. The most common of these HIV-related oral diseases are candidiasis, aphthous-like ulcers, hairy leukoplakia, HIV-related periodontal disease, bacterial infections, herpes labialis, recurrent intraoral herpetic infection, herpes zoster, oral warts, and Kaposi's sarcoma.

d. AIDS is characterized by a defect in cell-mediated immunity that leaves the host vulnerable to a variety of systemic opportunistic infections and neoplasms. Opportunistic infections include PCP (Pneumocystis carinii pneumonia), encephalitis, meningitis, or pneumonia caused by cryptococci, cytomegalovirus, tuberculous and non-tuberculous (atypical) mycobacteria, Aspergillus, Candida, Nocardia, Strongyloides, and Toxoplasma organisms, as well as esophagitis caused by Candida or Herpes organisms.

e. Immunologic abnormalities associated with ARC and AIDS mark these as devastating diseases of the adult immune system. A profound defect in T-cell immunity is responsible for the clinical findings. The severe disruption of cell mediated immunity results in leukopenia, lymphocytopenia, anergy, and defective lymphocyte transformation. This results in an increase in opportunistic infections (more severe than those of patients on immunosuppressive therapy) as well as an increase in malignant tumors such as diffuse non-Hodgkin's lymphoma and Kaposi's sarcoma.

f. In HIV-infected patients, oral candidiasis is the most common early oral manifestation. Candida infection may present as an atrophic, erythematous form; as hyperplastic oral candidiasis; as pseudo-membranous candidiasis (thrush); or as an angular cheilitis. Treatment is the same as described in 2.c.(1).(i).

g. The patient's ability to resist infection and to eliminate bacteremias produced during oral/dental therapy must be considered. The hematological derangements associated with HIV infection become more serious as the disease progresses. Standard hematologic profiles of PT, PTT, complete blood count (CBC), and bleeding time should be ordered prior to any surgical procedure. Patients with HIV infection may not respond well to endodontic procedures or to oral surgical procedures, and should be closely followed.

h. Patients with FUO (fevers of unknown origin) should be evaluated to rule out periodontal disease as a source of the infection. Appropriate microbiological studies, including anaerobic analysis, should be performed. Rapidly progressive periodontal infections must be treated as soon as detected, utilizing tissue debridement, thorough scaling and root planing, oral rinses with chlorhexidine gluconate or povidone iodine solutions, and systemic antibiotics such as metronidazole. Once the acute phase is under control, the patient should be followed every 1 to 2 months with treatment interventions as needed.

i. Kaposi's sarcoma may present first as an oral lesion and may occur anywhere in the oral cavity. However, the palate has most often been the first area involved. The lesions are frequently asymptomatic until they enlarge or ulcerate. Treatment depends upon the location, size, severity of symptoms, and the number of lesions present. Radiation therapy is a good palliative treatment for painful advanced lesions which may interfere with normal function. Smaller lesions may be treated by intralesional injections of Vilban, by cyrosurgery, by alpha-interferon, or by conventional surgical procedures.

(d) **Followup**

1. Appropriate outpatient follow-up appointments will be assured for all immunocompromised protocol patients undergoing dental treatment.

2. The immunocompromised patient's primary care physician should be kept informed of treatment progress and complications.

REFERENCES

1. Sonis, S.T., Fazio, R.C., and Fang, L.: Principals and Practice of Oral Medicine, W.B. Saunders Co., Philadelphia, PA 1984.

2. Little, J.W. and Falace, D.A.: Dental Management of the Medically Compromised Patient, 3rd Edition, C.V. Mosby Co., St. Louis, MO, 1988.

3. Rose, L.F. and Kaye, D.: Internal Medicine for Dentistry, C.V. Mosby Co., St. Louis, MO, 1985.

4. Rubin, R.H. and Young, L.S.: Clinical Approach to Infection in the Compromised Host, Plenum Medical Book Company, New York, NY, 1988, pp. 381-401, 649-666.

5. Robertson, P.B. and Greenspan, J.S.: Oral Manifestations of AIDS-Diagnosis and Management of HIV-Associated Infections, PSG Publishing Co., Inc., Littleton, MA 1988.

6. Wright, W.E., et al: An Oral Prevention Program for Patients Receiving Radiation and Chemotherapy, JADA, 110: 43-47, 1985.

h. **Guidelines for Dental Involvement in the Management of Patients with Pulmonary Disease**

(1) **Background/Rationale.** Patients with certain pulmonary diseases have decreased pulmonary reserve, are prone to medication reactions and, in some instances, present risks to health care providers. Inadequate pretreatment evaluation or dental treatment without consideration for a patient's compromised pulmonary status is associated with increased morbidity and mortality. For example, placing a compromised patient in a supine position for dental care may produce immediate respiratory distress. Sedatives, narcotics, and other drugs routinely given by dentists may suppress respiratory centers or cause other adverse pulmonary effects. Debilitated patients with decreased cough reflex and/or COPD (chronic obstructive pulmonary disease) are subject to airway blockage from unwitnessed aspirations of dental materials during treatment. It is also important to maintain the oral environment in a healthy state to decrease the risk of pulmonary infection that may result from aspiration of septic oral debris.

(2) **Protocol Recommendations**

(a) **Responsibilities**

1. All members of the medical staff involved in the primary care of patients with pulmonary disease must assure that, through routine examination or consultation referral, those patients have the opportunity to be evaluated by the Dental Service.

2. Examining dentists are responsible for the identification and evaluation of oral problems and, with the primary care physician, for assessing the correlation of those problems (or treatment thereof) with the pulmonary condition.

3. The Chief, Dental Service, or designee, is responsible for determinations regarding eligibility, prioritization and extent of care, as well as the overall supervision of the dental component of treatment.

4. Each treating dentist is responsible for the dental management of patients assigned, coordination with the primary care physician, and the actual delivery of dental care.

5. Each member of the Dental Service staff will maintain current certifications in CPR (cardiopulmonary resuscitation) and be knowledgeable regarding activation of the emergency medical system within the medical facility.

(b) **Procedures**

1. Patients with the following pulmonary disorders will be identified as protocol patients:

a. COPD (chronic obstructive pulmonary disease).

b. Asthma.

c. TB (tuberculosis).

d. Sarcoidosis (and other diffuse "interstitial" lung diseases).

2. The following mechanisms will be used by the Dental Service to identify patients with pulmonary disease:

a. Observation of oral and paraoral symptomology during Dental Service examination.

b. Review of medical history and findings during oral examinations conducted on inpatients and on eligible outpatients undergoing elective or emergent care in the dental clinic.

c. Consultation requests from appropriate services or clinics; i.e., Pulmonary Medicine, Thoracic Surgery, Medicine, etc.

3. Retrospective review of the daily G&L sheets for admitting diagnoses of pulmonary disease and review of special procedure schedules (such as pulmonary function tests) may be used as quality assurance measures.

4. Completion of a comprehensive dental evaluation and formulation of specific treatment recommendations will be guided by the following:

a. A comprehensive oral examination and specific treatment recommendations should be completed within 24 hours following identification of a protocol patient. A summary of the dental findings and treatment plan will be provided either as a progress note or as a consultation response.

b. Dental treatment recommendations will be formulated according to acceptable dental practices with specific consideration for the patient's pulmonary status, risk factors, restrictions, limitations, level of pulmonary compensation, and prognosis. Generally speaking, aspiration-risk, advanced COPD patients require early and continued dental surveillance and should be given the highest priority in this protocol category. Patients with other pulmonary disorders must be judged individually on the basis of the nature and degree of pulmonary disability relative to the contemplated dental procedure. For example, a patient with well-controlled COPD should be able to see a private dentist or be treated on an outpatient basis for most dental procedures. However, a patient who is poorly compensated may require the benefit of a hospital milieu and a hospital trained dentist to reduce the risks involved with a needed extraction or other procedure.

c. Unless the veteran has statutory entitlement to comprehensive outpatient dental care, the dental treatment provided to VA inpatients will be limited to that which is:

(1) Professionally defensible as essential to the treatment of their medical problem,

(2) Emergent (pain, trauma, hemorrhage or acute infection),

(3) Needed to maintain reasonable health and nutritional viability in patients whose degree of medical disability or risk requires that dental care be provided within the medical center, and

(4) Needed to maintain reasonable health, nutritional viability and quality of life in long-term patients (over 100 days of hospitalization).

d. Dental findings and treatment recommendations will be recorded on VA Form 10-7978f or other approved oral exam form. The patient's primary care physician will be advised of the dental findings and the dental recommendations regarding patient management via telephone and/or a progress note. Countersignature of the dental treatment plan will be requested.

5. Wherever and whenever feasible, there should be active participation in pulmonary treatment planning conferences by a designated member of the Dental Service. A dental evaluation and tentative treatment plan will be prepared for each patient presented. The patient's dental needs will be correlated with the pulmonary treatment plan to minimize delays, decrease risks, and reduce potential morbidity which might result from uncoordinated treatment.

6. The following considerations by a treating dentist are required prior to initiation of care:

a. For inpatients, a current pulmonary status including history, symptoms, diagnosis, physical examination, current labs, special studies, current medications, and the recommendations of the primary care physician will be fully documented prior to dental treatment. It is imperative that the primary care physician is briefed on the type and extent of dental treatment planned and any anticipated complications so that proper coordination with the patient's therapeutic plan is accomplished.

b. Stable pulmonary outpatients with acute dental pain or infection may be managed prior to physician consultation. Only the minimum intervention required to control the acute situation will be provided. The safety and well-being of the patient will receive the highest priority. Any further treatment of the patient's dental needs will be deferred until the primary care physician can be consulted.

c. If the patient is to be hospitalized for dental treatment, the following criteria will usually be applied:

(1) If the primary indication for the hospitalization is the pulmonary status, the patient will be admitted to the Medical Service, with Dental Service consulting.

(2) If the primary indication for the hospitalization is the dental problem, the patient will be admitted to the Dental Service, with Medical Service consulting.

7. Coordination of treatment is a joint responsibility of the dentist and the primary care physician, and will be guided by the following:

a. The timing and sequencing of dental and medical treatment are important for certain pulmonary patients; e.g., only in the case of dental/oral emergencies should dental treatment precede chemotherapeutic treatment of TB patients.

b. Special restrictions, adjustments of medication, and dental concerns involved in the management of the patient's pulmonary condition will be coordinated with the primary care physician via direct contact or telephone.

c. Modifications in the delivery of dental care will be determined by the treating dentist following consultation with the primary care physician.

(c) **Management Guidelines.** The following information is provided primarily for dentist members of the medical staff to serve as guidelines in considering and delivering dental care to patients with various pulmonary diagnosis:

1. **COPD (Chronic Obstructive Pulmonary Disease)**

a. COPD is comprised of three main disease entities: Chronic bronchitis, emphysema, and chronic bronchiectasis. The first two conditions are commonly observed in combination and can be regarded as a single disease complex. The latter condition, however, is a discrete entity. For clinical purposes, the three can be considered as part of a spectrum of COPD. In addition, chronic asthma can give rise to COPD. While the prognosis for the patients with mild COPD is generally favorable, the outlook for patients with moderate or severe airway obstruction is far less favorable. Minimal exertion and/or postural changes may markedly affect the adequacy of respiration. The approach to dental treatment should be that of early intervention with a goal of achieving optimal oral health when COPD patients are at lower risk, followed by the institution of a preventive program to assist in maintaining oral health as pulmonary capacities deteriorate.

b. Observation of the patient while walking or at rest may give insight into the degree of respiratory impairment. Cyanosis of the extremities, secondary polycythemia on laboratory testing, dyspnea at rest or upon exertion, orthopnea, use of accessory respiratory muscles, barrel chest or other thoracic deformities may each indicate significant respiratory compromise. The patient's ability to walk stairs without difficulty or to blow out a match with the lips open are gross indicators of respiratory capacity. However, PFTs (pulmonary function tests) and arterial blood gases are more accurate indicators of respiratory function and provide baseline studies for subsequent comparisons. Any attempt at accurate assessment of the degree of respiratory impairment should begin with such testing.

c. The respiratory control centers of many patients with severe COPD are chronically desensitized to increased levels of CO2 in the blood. These patients depend upon, in many

cases, decreased levels of oxygen to stimulate respiratory effort (hypoxic drive). Therefore, administration of high flow rates of oxygen (i.e. greater than 2 liters of oxygen per minute via nasal cannula) may be sufficient to depress respiration and precipitate acute respiratory failure with resultant greater CO_2 retention and, in some cases, the need for urgent endotracheal intubation. If such patients require supplemental oxygen, only low flow rates (i.e. 1/2 to 2 liters per minute) should be utilized or, preferably in cases wherein the dental treatment allows, the use of oxygenation via a venti mask at 24 to 28 percent.

d. Dental treatment for COPD can be safely delivered if the patient's respiratory capacity is adequate and if the airway is carefully safeguarded during treatment. Sedation, if necessary, must be carefully administered to prevent significant respiratory depression. Nitrous oxide/oxygen analgesia is contraindicated for patients with severe COPD. The current standard of care for such patients would dictate that prior to the administration of significant sedation, formal pulmonary function testing and arterial blood gas tests be performed to assess the risks involved with such sedation. Pulmonary consultation should be sought in patients with moderately severe or severe obstruction on PFTs and in CO_2 retention.

e. **Mild COPD.** Patients with dyspnea only on significant exertion, who have mild airflow obstruction on pulmonary function testing, and near normal arterial blood gases, may be considered to have mild chronic obstructive pulmonary disease. These patients may not be taking medications for their condition, although clinical benefit might be derived from the institution of such agents. These patients may undergo most types of dental care without significant modifications in delivery.

f. **Moderate COPD.** This degree of COPD, defined as moderate airflow obstruction on pulmonary function testing, is seen in patients who may frequently have some degree of dyspnea on exertion and, in some cases, hypoxemia. Rarely will patients in this category have CO2 retention. However, the use of sedatives or other respiratory depressants for these people is hazardous. Bronchodilator medications are frequently used but may have cardiac stimulatory side effects. The methylxanthines (theophylline derivatives) likewise can have side and/or toxic effects that include tachycardia, arrhythmias, anorexia, nausea, vomiting, diarrhea and agitated behavior. Patients may have seizures or experience extreme thirst due to dehydration. The elderly often present with confusion as the earliest sign. The problem of dose management is compounded by low therapeutic indices. Epinephrine-containing local anesthetics should be administered carefully and only after consideration of alternatives.

g. **Severe COPD.** Patients in this category are defined as having severe degrees of airflow obstruction on pulmonary function testing. Patients in this category may have CO2 retention and significant dyspnea even at rest. Characteristics of right heart failure may be present, i.e. cor pulmonale, usually requiring continuous bronchodilator therapy. Many of these patients will require continuous oxygen therapy as well. Patients in this category who experience acute episodes of respiratory distress should receive only minimal dental intervention to manage acute problems until the pulmonary problem has been stabilized. Hospitalization may be indicated even for routine dental procedures. Sedatives, nitrous oxide/oxygen analgesia, and/or oxygen administration must be cleared with the primary care physician prior to dental treatment.

(2) **Asthma**

a. Asthma is characterized by reversible episodes of bronchial obstruction, and respiratory distress secondary to bronchiolar constriction, increased bronchiolar

secretions, and edema of the bronchiolar mucosa. Acute attacks may occur as a result of particulate allergens, anxiety, stress, changes in weather, exercise, and/or upper respiratory tract infections. Therefore, a history of allergy to proposed operative medications must be vigorously sought.

b. The frequency and severity of attacks should be determined by history, pulmonary function testing, and indications of the patient's response to medication.

c. Occasional patients give a history of asthma in childhood, with no acute episodes following adolescence; or report only mild, infrequent acute episodes. Such patients require negligible modifications in dental care. Other patients report frequent attacks or episodes which do not readily respond to medication. Precautions are necessary to assure compliance with medications, to alleviate anxiety, to avoid precipitating drugs, and to be prepared to treat acute episodes.

d. Medications for chronic asthmatic conditions for the acute intermittent asthmatic attacks include beta adrenergic agonists delivered via metered dose inhaler canisters, e.g. albuterol and metaproterenol. Second line agents include ipratropium and theophylline derivatives. For the prophylactic prevention of asthmatic attacks, cromolyn is utilized. For recurrent attacks with inflammatory characteristics, corticosteroids in the form of either oral or aerosol topical sprays are employed, e.g. prednisone orally or beclomethasone or triamcinolone sprays topically. Nebulized beta agonist via hand held nebulizers with drugs such as metaproterenol and albuterol are generally used to treat acute severe attacks, usually in hospital or emergency room situations. Otherwise, metered dose inhaler canisters are used and should be available during dental treatment.

e. Sedation should be strictly avoided in patients in whom acute asthmatic episodes are current or have recently occurred. Sedative antihistamines with atropinic effects may, in addition, result in drying of secretions. Other agents known to be asthmatic inducers, e.g., aspirin and other non-steroidal anti-inflammatory agents (with prostaglandin inhibition-related bronchospasm) should be avoided to prevent acute asthmatic attacks.

3. **Tuberculosis (TB)**

a. Skin testing and chest radiographs are generally the first lines of screening tests for TB. However, some medical centers have now eliminated the use of chest x-rays as a screening modality because of the low cost/benefit ratio. Skin testing with tuberculin PPD (purified protein derivative) is useful to measure the patient's response to tuberculo-proteins (inactivated antigenic agents). A positive PPD indicates only that the patient has tuberculous "infection" (which may be quiescent), but does not determine whether physiologic or anatomic derangements (e.g., lung cavities) are present. In addition, individuals can test positively, indicating previous exposure, without having ever developed active disease. Once an individual tests positively, subsequent skin testing is unnecessary, diagnostically pointless, and may, in fact, result in the sloughing of tissue at the injection site unless topical steroids are applied.

b. In patients with productive cough and a positive PPD, a chest x-ray, if normal, will exclude significant, transmittable pulmonary tuberculosis. If a chest x-ray is abnormal, repeated sputum smears and cultures for AFB (acid fast bacteria) will be required to establish or exclude the diagnosis, establish the most appropriate therapeutic agent, and monitor the response. Patients with active untreated disease (positive sputum) should only receive minimal emergent dental care. However, after 10 to 14 days of appropriate therapy, although the sputum remains positive for AFB, infectious transmission is less likely and less urgent dental procedures may proceed with appropriate precautions. Elective procedures should probably be delayed for 6-8 weeks or until smears are negative.

c. Treatment generally consists of long-term chemotherapy, with numerous regimens now accepted as effective. A 9-month course of daily INH (isoniazid) and rifampin is the most commonly employed regimen. The vitamin pyridoxine should be considered for elderly patients to minimize INH-induced nephrotoxicity. A 6-month regimen beginning with daily INH, rifampin and pyrazinamide for 2 months followed by daily INH and rifampin for 4 months is especially efficacious for INH-susceptible infections. Streptomycin or ethambutol is added if INH-resistance is suspected during the first 2 months. However, streptomycin should be avoided in elderly patients because of potential ototoxicity. Treatment efficacy is determined by serial examination of sputum smears and cultures for AFB. Most patients will demonstrate negative smears after 3 months of chemotherapy. Failure of response is indicated by failure of sputum cultures or smears to become negative or, redevelopment of positive cultures or positive smears, as well as progression of disease in chest radiographs.

d. A high success rate in preventing active tuberculosis in patients having positive skin test has been reported if prophylactic treatment with INH (or rifampin in cases resistant to INH) is given for 6 to 12 months. Indications for tuberculosis preventive therapy are based on CDC (Centers for Disease Control) recommendations for certain risk groups. Guidance is as follows:

(1) High Risk Group - Preventive therapy should be instituted for those patients (regardless of age) with a + PPD skin reaction measuring greater than 5 mm (but less than 10 mm) and having:

a. Close contacts with active tuberculosis cases;

b. Known or suspected HIV infection; or

c. Abnormal chest X-ray with fibrosis consistent with an old healed tubercular lesion. Individuals having recent skin test conversions (within the last 2 years) measuring 10 mm or more (15 mm or more if over 35 years of age) should also have preventive therapy. Similarly, therapy should be given if the + PPD skin test measures 10 mm or more, and the individual:

(1) Is an I.V. drug abuser (negative for HIV); or

(2) Has silicosis, a gastrectomy or jejunoileal bypass, recent weight loss of 10 percent or more of body weight, chronic renal failure, diabetes mellitus, immunosuppression, or widespread malignancy such as lymphoma or leukemia.

(2) No Risk: High Incidence Group. In this group, therapy is recommended for those patients (under 35 years of age), with a + PPD equal to or greater than 10 mm, and who are:

(a) foreign-born from an area with a high prevalence of tuberculosis;

(b) from a medically underserved, low-income population (e.g.,Blacks, Hispanics, Native Americans, homeless, food handlers, unskilled laborers); or

(c) residents of facilities for long-term care (e.g., nursing homes, correctional institutions, mental institutions).

Also in this group are patients who are over 35 years of age with a + PPD equal to or greater than 10 mm. However, no preventive therapy is considered necessary.

(3) No Risk: Low Incidence Group.

(a) In this group are patients with a + PPD equal to or greater than 15 mm, having no other risk factors. Patients, under 35 years of age, should be treated.

(b) Patients greater than 35 years of age with a + PPD equal to or greater than 15 mm should not be treated.

e. Untreated active TB patients should receive only emergent dental intervention. Minimal treatment to alleviate the acute problem should be delivered. More definitive care should be delayed (as stated above) until the patient has been on effective therapy for at least 3 weeks. Purely elective treatment should not proceed until cultures convert to negative. Patients with a history of untreated TB should not receive steroids.

4. **Sarcoidosis and Active Restrictive Interstitial Lung Disease.** Sarcoidosis is a chronic granulomatous disease of unknown origin. It is characterized by the presence of non-caseating granulomas resulting in the development of fibrotic and inflammatory changes in multiple organ systems. The lungs are the most common site of pathologic change. Symptoms of this disorder may range from the complete absence of respiratory symptoms to complete respiratory disability with hypoxemia and right heart failure. The diagnosis is suggested by enlargement of mediastinal lymph nodes on chest X-ray. Patients are frequently treated with chronic steroid therapy when certain clinical indications are found to include: the presence of iritis, progressive respiratory compromise, multiple constitutional symptoms including weight loss and fever, ventricular ectopy, central nervous system symptoms, hypercalcemia, and hypercalcuria. Numerous other interstitial diseases, e.g., scleroderma, asbestosis, and rheumatoid lung, can produce similar degrees of respiratory compromise, although unique signs and symptoms of those diseases may be present. Prior to dental treatment, consideration must be given to the degree of respiratory compromise and the possibility of (1) adrenal suppression in patients receiving chronic steroids necessitating the need for steroid prophylaxis, (2) infection, thrombocytopenia and neutropenia in patient's receiving immunosuppressive therapy.

d. **Followup.** Appropriate followup appointments with the patient's primary care physician must be assured for all pulmonary protocol patients undergoing dental treatment. The responsible physician should be notified when planned dental treatment has been completed. Any post-treatment coordination deemed necessary is a joint responsibility of the treating dentist and the physician.

REFERENCES

1. Murray, J.F.: Text Book of Respiratory Medicine. W.B. Saunders, Co., Philadelphia, 1988, p.p. 987-1168, 856-915, 1486-1500.

2. Treatment of Tuberculosis Infection in Adults and Children. AMERICAN THORACIC SOCIETY, Official statement adopted by ATS March 1986. Amer. Rev. Dis., 1986, 134:355-363.

3. Standards for the Diagnosis and Care of Patients with Chronic Obstructive Pulmonary Disease and Asthma. AMERICAN THORACIC SOCIETY, Official Statement, adopted November 1986. Amer. Rev. Resp. Dis., 1987, 136:225-244.

4. Centers for Disease Control: The use of preventive therapy for tubercular infection in the United States. Recommendations of the Advisory Committee for Elimination of Tuberculosis. MMWR 39: 9-12, May 18, 1990.

i. Guidelines for Dental Involvement in the Management of Patients with Mental Disorders

(1) Background/Rationale

VA may provide sound, medically coordinated dental treatment that has a direct bearing on a psychiatric disorder for which the patient is currently hospitalized. This care may also be provided to outpatients within existing resources, providing current legislative entitlements and other treatment priorities are not compromised. The VA treats large numbers of patients classified as psychotic. These patients vary widely in the severity of their disease and their ability to tolerate or accept dental treatment. Service-connection, length of hospitalization, whether the patient is a domiciliary resident or a nursing home patient, and the impact of dental care on the patient's mental state are relevant to their eligibility for type and extent of dental care. Clearly, dental disease is prevalent in these patients because few have sought or obtained care privately. Behavioral instability, medication side effects, and the potential for unfavorable drug interactions greatly increase risks when providing dental care for this population. Specific treatment planning and close interaction with the primary care physician are essential.

(2) Protocol Recommendations

(a) Responsibilities

1. All members of the medical staff involved in the primary care of patients with mental disorders must assure that through routine examination or consultation referral, these patients will have the opportunity to be evaluated by the Dental Service.

2. Examining dentists are responsible for the identification and evaluation of oral problems and, with the primary care physician, for assessing the correlation of these problems (or treatment thereof) with the mental disorder.

3. The Chief, Dental Service, or designee, is responsible for determinations regarding eligibility, prioritization and extent of care, as well as the overall supervision of the dental component of treatment.

4. Each treating dentist is responsible for coordination with the primary care physician and the actual delivery of dental care.

(b) Procedures

1. Patients with the following mental disorders will be identified as protocol patients:

a. Major Depression

b. Bipolar Disorder

c. Schizophrenia

d. PTSD (Post-traumatic Stress Disorder)

e. Dementia

2. The following mechanisms will be used by the Dental Service to identify protocol patients:

a. Review of medical history and findings conducted during oral examination of inpatients and of eligible outpatients undergoing elective or emergent care in the dental clinic.

b. Consultation requests from appropriate services or clinics; i.e., mental hygiene, psychiatry, etc.

3. Evaluation and formulation of specific dental treatment recommendations will be guided by the following:

a. Protocol patients must be carefully selected based upon a direct relationship of their oral health needs with their mental disorder. Resource limitations will not permit inclusion of all patients with psychiatric diagnoses in this protocol. Final decisions must be based on sound judgments reached by close coordination between the Dental Service and other services responsible for the psychiatric care.

b. Care must be exercised by all members of the treatment team to guard against raising the expectations of patients relative to dental care. Examinations by the Dental Service must be considered part of the admission physical evaluation. Patients must be made aware that interrelationships with their psychiatric problem determine whether or not dental treatment will be provided and, even for those selected on that basis, that the treatment may be limited to the most urgent needs and/or that which directly affects their primary diagnosis.

c. A comprehensive oral examination and a specific treatment plan should be completed following identification of a protocol patient. A summary of the dental findings and treatment recommendations will be provided either as a progress note or as a consultation response.

d. Dental treatment recommendations will be formulated according to acceptable dental practices with specific consideration for the patient's stage of therapy, risk factors, restrictions, limitations, and prognosis. Patients with mental disorders must be evaluated individually for dental care on the basis of the severity of their mental disorder and its relationship to contemplated dental procedures. For patients who are in an extended care program and for whom dental care is viewed as having a positive impact on the patient's self-image and, ultimately, successful completion of the program, the benefits of a hospital milieu and a hospital trained dentist can be significant.

e. Unless the veteran has statutory entitlement to comprehensive outpatient dental care, the dental treatment provided to VA inpatients will be limited to that which is:

(1) Professionally defensible as essential to the treatment of their psychiatric problem,

(2) Emergent (pain, trauma, hemorrhage or acute infection),

(3) Needed to maintain reasonable health, nutritional viability in patients whose degree of psychiatric disability or risk requires that dental care be provided within the hospital.

(4) Needed to maintain reasonable health, nutritional viability and quality of life in long-term patients (over 100 days of hospitalization).

f. Dental findings and treatment recommendations will be recorded on VA Form 10-7978f or other approved oral exam form. The patient's primary care physician will be advised of the dental findings and treatment recommendations via telephone and/or progress note. Countersignature of the dental treatment plan will be requested.

4. Wherever and whenever feasible, the Dental Service should have close communication with the professional staff responsible for the psychiatric treatment planning conferences. Dental evaluation and tentative treatment plans will be prepared for patients identified as appropriate for this protocol. Patients' dental needs will be correlated with planned psychiatric care to minimize interruptions in psychiatric therapy and avoid scheduling conflicts.

5. The following considerations by a treating dentist are required prior to initiation of care:

a. For inpatients; current status, including history, symptoms, diagnosis, physical examination, current labs, special studies, current medications, and the recommendations of the primary care physician will be documented prior to dental treatment. It is imperative that the psychiatrist be briefed on the type and extent of dental treatment planned and any anticipated complications so that proper coordination with the patient's therapeutic plan is accomplished.

b. Stable outpatients with acute dental pain or infection may be managed prior to physician consultation. Only the minimum intervention required to control the acute situation will be provided. The safety and well-being of the patient will receive the highest priority. Any further treatment of the patient's dental needs will be deferred until the psychiatrist can be consulted.

c. Outpatients receiving psychiatric care for their service-connected mental disorder may receive dental treatment only upon referral from the primary-care physician.

d. Should the patient need to be hospitalized for dental treatment, the following criteria will usually be applied:

(1) If the primary indication for the hospitalization is the mental disorder, the patient will be admitted to the Psychiatry Service (or Medical or Neurology Service for patients with dementias), with Dental Service consulting.

(2) If the primary indication for the hospitalization is the dental problem, the patient will be admitted to the Dental Service, with Psychiatry Service consulting.

6. Coordination of treatment is a joint responsibility of the dentist and the primary care physician, and will be guided by the following:

a. Special restrictions and applicable information on medications or patient management should be coordinated via direct contact or telephone.

b. The primary care physician should be notified of any modifications in the dental treatment plan and any use of prescription drugs in the course of dental care.

(c) **Management Guidelines.** The following information is provided primarily for dentist members of the medical staff to serve as guidelines in considering and delivering dental care to patients with mental disorders.

1. **Major Depression.**

a. Major Depression is an affective disorder whose essential feature is a prolonged depressed disturbance of mood which colors the patient's life. There is a loss of interest or pleasure in all or almost all daily activities and pastimes. The disturbance is prominent, persistent, and may be associated with a loss of appetite and a loss of weight, sleep disturbance (usually insomnia) and decreased energy. The individual will appear sad (frequently tearful) and express feelings of worthlessness, hopelessness and guilt. The individual will have difficulty with memory, concentration, be easily distracted and indecisive. Thoughts of death (be it a fear of dying or a wish to die) or suicide are common. Delusions or hallucinations are consistent with the individual's mood. They commonly feel persecuted and hear voices detailing their shortcomings. At the depth of an individual's depression there is a significant impairment in personal hygiene and an almost total absence of oral hygiene habits with a consequent increase in dental disease.

b. Patients with Major Depression frequently manifest the following dento-oral problems:

(1) Poor oral hygiene.

(2) Rampant dental decay.

(3) Advanced generalized periodontitis.

(4) Multiple missing teeth.

(5) Ill-fitting dental prostheses.

(6) Various oro-facial pain syndromes.

c. Major Depression is usually treated with medications or ECT (electro- convulsive therapy. The most common antidepressants used in treatment are:

*(1) Adapin (doxepin hydrochloride).

*(2) Asendin (amoxapine).

*(3) Desyrel (trazodone hydrochloride).

*(4) Elavil (amitriptyline hydrochloride).

*(5) Etrafon (perphenazine and amitriptyline HCl).

*(6) Limbitrol (chlordiazepoxide and amitriptyline HCl).

*(7) Ludiomil (maprotiline hydrochloride).

**(8) Marplan (isocarboxazid).

**(9) Nardil (phenelzine sulfate).

*(10) Norpramin (desipramine hydrochloride).

*(11) Pamelor (nortriptyline hydrochloride).

**(12) Parnate (tranylcypromine sulfate).

*(13) Sinequan (doxepin hydrochloride).

*(14) Surmontil (trimipramine maleate).

*(15) Tofranil (imipramine hydrochloride).

*(16) Triavil (perphenazine and amitriptyline HCl).

*(17) Vivactil (protriptyline hydrochloride).

* Tricyclic (heterocyclic) antidepressant.
** MAO inhibitor

d. The following are precautions for patients being treated with tricyclic (heterocyclic) antidepressants:

(1) The tricyclic drugs sometimes cause adverse reactions of concern to dentists. They may affect the cardiovascular system causing hypotension, orthostatic (postural) hypotension, tachycardia, arrhythmias, myocardial infarction and congestive heart failure. Because of their anticholinergic activity they may cause a dry mouth.

(2) Adverse drug interactions between medications used in dentistry and the tricyclic antidepressants may produce significant morbid reactions. Central nervous system depressant medications such as general anesthetic agents, sedatives/hypnotics, barbiturates and narcotics can have a potentiating interaction resulting in a severe respiratory depression. The administration of an antimuscarinic (anti-cholinergic) drug such as atropine or scopolamine can cause an increase in intraocular pressure.

(3) The debate as to the appropriateness of the use of local anesthetics containing epinephrine for patients receiving tricyclic antidepressant medications remains very active. Recent research reports have noted that the pressor effect of epinephrine can be potentiated by this class of drugs. It is most prudent to use an aspirating technique in order to avoid an intravascular injection of medication and to limit the administration of local anesthesia with 1/100,000 epinephrine to three 1.8 cc cartridges per hour.

e. The following are precautions for patients being treated with MAO (Monoamine Oxidase) Inhibitors:

(1) Adverse reactions to this drug of concern to dentists include disturbances in cardiac rate and rhythm, hypertension, orthostatic hypotension and a dry mouth.

(2) Local anesthetic agents employed for patients on MAO inhibitors should not contain epinephrine or Neo-Cobefrin. Although there is continuing controversy as to whether the dosage levels present a danger, the literature warns that their use can precipitate a hypertensive crisis which may result in a cerebrovascular accident, myocardial infarction, or death.

f. The following are precautions for patients receiving ECT (electroconvulsive therapy):

Prior to receiving ECT, patients receive sedative medications that, among other things, inhibit or abolish protective reflexes that guard against the aspiration of foreign objects. For that reason, it is imperative that loose teeth and/or calculus be removed prior to the ECT procedure.

2. **Bipolar Disorder**

a. Bipolar Disorder is an affective (outward manifestation of a person's feelings, tone, or mood) disorder in which the patient suffers from alternating, prolonged episodes of extreme elation and depression.

(1) During periods of mania there is generally a hyperactivity, which involves excessive participation in multiple activities (i.e. sexual, occupational, political, religious). There is an intrusive and demanding nature to the activities which goes unrecognized by the patient. Frequently the patient may dress in flamboyant, colorful, or strange clothing and may distribute money or advice to strangers. Pressured speech is common. It is loud, rapid, and difficult to interrupt. The speech is theatrical and dramatic, and there are abrupt changes in topic ("flight of ideas"). These persons are easily distracted and display grandiose delusions in which they claim a special relationship to God or some well-known figure from the political or entertainment world. They may go for days with little or no sleep and yet not appear tired. Liability of mood, with rapid shifts to anger or depression, is common.

(2) During periods of depression, there is a loss of interest or pleasure in almost all daily activities. This may be associated with a loss of appetite and a loss of weight, sleep disturbance (usually insomnia), and decreased energy. The person will appear sad (frequently tearful) and express feelings of worthlessness, hopelessness, and guilt. The person will also have difficulty with memory and concentration and will be easily distracted and indecisive.

(3) During both manic and depressive episodes, there is significant impairment in both social and occupational functioning and a need for protection from the consequences of poor judgment, hyperactivity, and the predilection to violent acting out. The most common complications of a manic episode are substance abuse and the consequences of actions resulting from impaired judgment, such as financial losses and illegal activities. The most common complication of an episode of depression is suicide.

b. Patients with Bipolar Disorders frequently manifest the following dento-oral problems:

(1) During periods of acute mania:

(a) Abraded oral mucosa secondary to over-vigorous use of oral health devices.

(b) Abrasion of tooth cervix due to over-vigorous use of a toothbrush.

(2) During periods of acute depression

(a) Poor oral hygiene.

(b) Rampant dental decay.

(c) Periodontal disease.

(d) Disregard of ill-fitting dental prostheses.

(e) Various oro-facial pain syndromes.

c. Both lithium carbonate and the neuroleptics (phenothiazine family of drugs) are effective in treating the manic phase of a bipolar disorder. Depressive episodes of this disorder are frequently treated by the temporary administration of antidepressants. Persons on long-term lithium therapy frequently complain of a generalized stomatitis and concurrent xerostomia. The use of artificial saliva products can make these patients more comfortable and thus better able to tolerate therapeutic levels of lithium. Adverse interactions between lithium and medications commonly used in dentistry have not been reported.

d. For those patients receiving neuroleptic medications for the manic phase of the disorder, dentists must be aware of the fact that these drugs may depress the hematopoietic system causing a decrease in the number of circulating red and white blood cells and platelets. This family of medications also causes fluctuations in blood pressure. Sedative medications used in dentistry may be potentiated by this group of drugs, with a resultant severe respiratory depression. The small amounts of epinephrine used in conjunction with dental anesthetic agents produce no adverse effects in the normotensive patient being treated with neuroleptics.

e. Sedative medications commonly used for dental appointments must be avoided for patients in the depressive phase of their disorder who are receiving tricyclic antidepressants. The interaction between these two classes of drugs can result in severe respiratory depression. Recent research reports have noted that the pressor effect of epinephrine can be potentiated by tricyclics. It is most prudent to use an aspirating technique during local anesthesia procedures in order to avoid an intravascular injection of medication and to limit the administration of local anesthesia with 1/100,000 epinephrine to three 1.8 cc cartridges in any 1 hour.

3. **Schizophrenia**

a. Schizophrenia is a psychotic disorder characterized by varying degrees of personality disorganization which lessens an individual's ability to effectively work and communicate with others. It is characterized by impairment of routine daily functions such as work, social relations and self-care. The patients' thoughts are disrupted by bizarre delusions and they have major disturbances in perception characterized by hallucinations. Frequently they lack the drive to follow a course of action through to its logical conclusion. Patients with schizophrenia often have a lengthy history of illness and severe dental problems. Because they are frequently confused, depressed, withdrawn or anxious; these patients often neglect or resist dental care. Family disassociation, low levels of education, marginal social and economic adjustment, and legal problems additionally tend to disrupt their commitment and ability to seek needed care. Institutionally, the associated administration of mood-altering drugs can cause xerostomia that increase dental problems.

b. Schizophrenia patients frequently manifest the following dento-oral problems:

(1) Decreased salivary flow.

(2) Increased caries rate.

(3) A decrease in the periodontal health index.

(4) Occasional parotitis.

(5) Dental attrition and trauma associated with maxillofacial movements in tardive dyskinesia.

c. Schizophrenia is usually treated with antipsychotic or neuroleptic drugs. These medications generally have a beneficial effect on the patient's mood and thought processes.

d. The most common antipsychotic (neuroleptic) agents used in the treatment of schizophrenia are:

(1) Haloperidol (Haldol).

(2) Loxapine succinate (Loxitane).

(3) Thioridazine hydrochloride (Mellaril).

(4) Thiothixene (Navane).

(5) Fluphenazine hydrochloride (Prolixin).

(6) Trifluoperazine hydrochloride (Stelazine).

(7) Chlorpromazine hydrochloride (Thorazine).

e. These antipsychotic medications can cause adverse reactions of concern to dentists.

(1) They can affect the cardiovascular system, causing tachycardia, fluctuations in blood pressure, and orthostatic (postural) hypotension.

(2) The hematopoietic system may be depressed with a resultant decrease in the number of white blood cells, red blood cells, and platelets.

(3) Changes in and about the orofacial region include flushing, parotid gland enlargement, and CNS (central nervous system) phenomena of tardive dyskinesia (continuous facial, lip, and chewing movements).

f. Interactions between dental medications and those commonly used in the treatment of schizophrenia can produce adverse reactions.

(1) CNS depressant medications such as general anesthetic agents, sedatives/hypnotics, barbiturates, and narcotics can have the depressant effect intensified by neuroleptic drugs, resulting in a severe respiratory depression.

(2) The administration of an antimuscarinic (anticholinergic) drug such as atropine or scopolamine can cause an increase in intraocular pressure.

(3) Thioridazine (Mellaril) is the antipsychotic medication most likely to precipitate changes on an electrocardiogram. The clinical significance of these changes and the possible effects epinephrine may have on the changes have not been established. Limiting

the dosage and ensuring that an intravascular injection of medication has been avoided is certainly prudent.

g. The treating dentist should consult the primary treating physician to obtain an opinion as to the patient's medico-legal competence to sign a consent for the proposed care.

4. **PTSD**

a. PTSD is most commonly seen among Vietnam-era veterans exposed to extensive and intensive combat experience. The American Psychiatric Association has defined precise diagnostic criteria for PTSD as "Following exposure to a psychologically traumatic event that is outside the range of usual human experience, a person re-experiences the traumatic event." The traumatic event can be re-experienced in a variety of ways. Intrusive thoughts of past combat experiences may interrupt daytime activities. These thoughts can be painful, anxiety provoking, uncontrollable and last for a fleeting moment or for several minutes.

(1) Many combat veterans fear sleep because of nightmares. They may have dreams about being pursued, trapped, shot at or left with an empty weapon, and awaken in a state of terror. These recurrent noxious dreams are usually about a specific traumatic incident such as the death of a friend or the killing of a civilian. Such dreams become more frequent during periods of stress (physical illness, marital discord, financial problems).

(2) Diminished responsiveness to the external world, referred to as "psychic numbing" can occur. A person manifesting this response may appear to be uninvolved when he deals with his family or work. He complains of feeling detached, estranged, and unable to feel emotions of any type, especially those associated with intimacy. Consequently, such individuals are apt to become isolated and are prone to marital, family, peer and employment problems.

(3) PTSD rarely exists as a discrete entity. It shares many of the symptoms seen in other psychiatric disorders. States of anxiety with restlessness, nervousness, and tremor may be present. Depressive symptoms are common, and include decreased energy, loss of appetite, periods of blueness, decreased sex drive, and crying spells. Some patients complain of increased irritability, accompanied by sporadic and unpredictable explosions of aggressive behavior with minimal or no provocation. Other patients display nonviolent impulsive behavior such as sudden trips, unexplained absences, or changes in lifestyle or residence.

(4) During the Vietnam war, there was widespread availability and use of both alcohol and drugs. They were used by the soldiers as a means of adapting to the situation by attempting to control their feelings or numbing their awareness. Unfortunately, long-term addiction problems were the frequent result. Recently a delayed form of PTSD has been identified among World War II and Korean War veterans. Many of these men were prisoners of war between 20 and 40 years ago, but only recently have they experienced the symptoms of PTSD Similar to their younger Vietnam era cohorts, they relive wartime incidents in daytime ruminations and in nightmares. It is postulated that either "age" or the experiencing of a "new" stressful event may have disrupted their previously erected defense mechanisms. Loss of a spouse, serious injury or the loss of a job are among the situations that have precipitated this delayed form of PTSD. There is a

high incidence of severe medical problems accompanying the delayed PTSD Most common is hypertensive cardiovascular disease seen in association with a history of myocardial infarction and coronary artery by-pass surgery. Gastrointestinal disease is also common. These individuals frequently have peptic ulcer disease or ulcerative colitis. It is now postulated that prolonged periods of sub-clinical stress rather than malnutrition and physical abuse suffered while a prisoner of war may be responsible for the prevalence of medical problems among this group of patients.

(6) Treatment of either type of PTSD must be directed toward the medical and/or the substance abuse problems as well as the behavioral techniques, medications, and various forms of psychotherapy directed toward the basic psychiatric problem.

b. PTSD patients frequently manifest a number of dento-oral problems.

(1) **Depressed Phase:**

(a) Poor oral hygiene.

(b) Rampant dental decay.

(c) Advanced generalized periodontitis.

(d) Glossodynia.

(e) Temporomandibular joint disturbances.

(2) **PTSD in Association with Alcohol Abuse:**

(a) Numerous missing teeth.

(b) Rampant dental decay.

(c) Advanced generalized periodontitis.

(d) Dental attrition secondary to severe bruxism.

c. When treating Vietnam veterans suffering from PTSD, it is important to understand the nature of the war and its impact on those who served there. The individuals affected frequently confuse dentists and other health care personnel with those authority figures who "misled them" and "sent them into combat." They consider dental personnel to be untrustworthy and frequently refuse care or are reluctant to allow treatment to progress. The first treatment objective must be the establishment of a trusting, professional and open relationship.

d.. PTSD patients who also abuse alcohol are a special problem. Long-term alcohol abuse affects the liver and bone marrow. The liver synthesizes many proteins, including those involved in blood coagulation. Patients with severe alcoholic liver disease may have deficient protein levels causing impaired clotting and increased risk of hemorrhage. Abnormally low total protein or albumin levels may prolong the post-operative healing process and increase the risk of post-operative infection. The following blood tests are indicated for these patients: a CBC with differential and platelet estimation, PT, PTT,

and total protein, albumin, and liver transaminases (SGOT, SGPT, GGTP). When patients have clinically significant test abnormalities, oral surgical procedures should be delayed until tests are within normal limits and/or evaluation by their physicians indicates that such treatment can proceed.

e. Patients suffering from PTSD frequently use illicit drugs intravenously. It is not unusual for them to share contaminated needles and syringes and be at risk for the development of hepatitis B, AIDS or ARC. It is mandatory prior to the institution of dental care to obtain the HBsAg screening test and to closely evaluate the patient for signs and symptoms of ARC or AIDS. Patients who have a positive screening test for hepatitis or those who give a history consistent with ARC or AIDS will require further evaluation by their physician. Dental treatment of these patients, like that of the general population, requires universal infection control precautions in order to mitigate the possibility of cross contamination between the patient and the members of the dental team or other patients.

f. Patients with PTSD are frequently treated for depression with heterocyclic antidepressants. The heterocyclic antidepressant medications include the classic tricyclics, e.g. imipramine (Tofranil) and amitriptyline (Elavil); modified tricyclics, e.g. amoxapine (Asendin) and trimipramine (Surmontil); and the tetracyclic antidepressant maprotiline (Ludiomil). These medications may adversely affect the cardiovascular system causing hypotension, orthostatic (postural) hypotension, tachycardia, or cardiac arrhythmias.

(1) Adverse drug interactions between medications used in dentistry and the heterocyclics may produce significant morbid reactions. Central nervous system depressant medications such as general anesthetic agents, sedatives/hypnotics, barbiturates, and narcotics can have their effect potentiated with a resultant severe respiratory depression. The administration of an anticholinergic drug like atropine or scopolamine can cause an increase in intraocular pressure. In addition, patients receiving these medications frequently complain of a dry mouth and a sour, metallic taste.

(2) The debate as to the appropriateness of the use of local anesthetics containing epinephrine for patients receiving these non-MAO-type antidepressants remains active. Recent research reports have noted that the pressor effect of epinephrine can be potentiated by this class of drugs. It is most prudent to use an aspirating technique during local anesthesia procedures in order to avoid an intravascular injection of medication and to limit the administration of local anesthesia with 1/100,000 epinephrine to three 1.8 cc cartridges during any 1 hour.

g. Other patients with PTSD associated depression, anxiety, and phobias for whom the heterocyclics have not been effective are treated with MAO inhibitor antidepressants. The most commonly used drugs in this family are phenelzine sulfate (Nardil), isocarboxazid (Marplan) and tranylcypromine sulfate (Parnate).

(1) Like the heterocyclic antidepressants, MAO inhibitors adversely interact with many medications used in dentistry. They interfere with the hepatic metabolism of a number of drugs. They prolong and intensify the effects of central nervous system agents such as general anesthetics, sedatives, antihistamines and anticholinergic agents (atropine and scopolamine).

(2) Patients being treated with MAO inhibitors should **never** receive a local anesthetic containing epinephrine or Neo-Cobefrin. Although there is controversy whether or not the dosage levels precipitate a dangerous interaction, the literature warns that severe hypertension might result causing a cerebrovascular accident, myocardial infarct or death.

h. Relief of postoperative dental pain requires close coordination among the treating dentist, the physician, and, of course, the patient. Patients with a long history of substance abuse and/or a low pain threshold tend to be manipulative and devise schemes to encourage the prescribing of potent narcotic analgesics. If accommodated, they are at risk of developing a renewed addiction in the post operative phase of dental care. A timely consultation with the patient's psychiatrist is appropriate if the dentist believes that the clinical situation does not warrant the use of such medications.

i. Dentistry has a role in the overall treatment of PTSD patients. Personal esteem, social and occupational rehabilitation are enhanced when an esthetic and biologically sound restoration of the orofacial structure is provided.

5. **Dementias**

a. Dementias have been variably classified as medical (neurological) and/or psychiatric disorders. The American Psychiatric Association has described dementia as a loss of intellectual function sufficiently severe to interfere with social or occupational abilities and notes that the loss involves memory, judgment, abstract thought and a variety of higher cortical functions. Individuals 65 years of age and older are most susceptible to organic brain syndromes. The prevalence of dementia increases with age over 65, from approximately 2 to 3 percent of those aged 65 through 79 to more than 20 percent for those 80 and older. Dementia undermines oral health by affecting the patient's ability and willingness to perform appropriate oral hygiene. In most advanced dementias, apraxias (inability to perform purposeful movements) and memory loss are profound. Patients become incapable of recognizing and making proper use of objects including toothbrush, toothpaste and dental floss. Thus they are unable to perform normal oral hygiene procedures.

b. Demented patients frequently manifest the following dento-oral problems:

(1) Maxillofacial injuries.

(2) Traumatic oral ulcerations.

(3) Extensive dental caries (coronal and root).

(4) Reduction in periodontal health index.

(5) Numerous missing teeth.

(6) Attrition, abrasion and migration of residual dentition.

(7) Salivary gland dysfunction.

(8) Severe atrophy of residual alveolar ridges.

(9) Ill-fitting and/or damaged dental prostheses.

(10) Hyperplastic redundant tissue at denture borders and at palatal vault, secondary to ill-fitting prostheses.

c. Restoration of oral health function is best completed as early as possible in progressive dementias since the patient's ability to cooperate during dental treatment diminishes during periods of peak behavioral dysfunction, i.e., the middle or second stage of Alzheimer's disease. If long-term care is anticipated, full mouth diagnostic radiographs should be taken and kept for future use. In dentate patients, fabrication of cap splints or custom mouth guards for fluoride treatments facilitates long-term fluoride therapy. Appropriate dental management requires close liaison between the responsible dentist, physician and nursing staff. Concomitant medical problems need to be controlled and appropriate precautions taken prior to invasive dental therapy. The elderly tend to be especially sensitive to pharmacologic agents and the risk of detrimental side effects seems even higher in the demented elderly. Dentists must avoid the prescribing of medications which adversely interact with any of the patient's current medications.

d. The liver and the kidney are the two most important organs which show age changes that relate specifically to dental therapeutics. The elderly with decreased levels of albumin have a greater percentage of many drugs in their free state, unbound to albumin and able to work but, unfortunately, also able to precipitate a toxic reaction. The liver is the organ responsible for metabolism of most medications. In the aged individual, there is lessened hepatic mass and blood flow, both of which result in a decreased rate of metabolism of drugs frequently used in dentistry. Specifically, local anesthetics (lidocaine and mepivacaine), the analgesics (aspirin, acetaminophen and codeine), and certain antibiotics (ampicillin and tetracycline) are affected. The kidney, the organ responsible for excretion of medications and metabolic by-products, also undergoes age-related changes. Thus medications and metabolic by-products remain in circulation for increased periods of time. Long acting benzodiazepines (e.g., diazepam (Valium), barbiturates and non-steroidal anti-inflammatory agents) should be avoided whenever possible. Consultation with a geriatrician, pharmacist or geriatric clinical nurse familiar with the patient will assist the dentist in arriving at the appropriate dosage level and frequency of administration. A good rule of thumb is to remember that, in the elderly, a single dose of most drugs will produce a peak blood level twice as high and have a half-life twice as long as in a younger patient.

e. The appropriate psychological set on the part of the dentist and auxiliary staff will facilitate efficient and humane care. One must be able to capture the patient's wandering attention. This can usually be accomplished by being alert to the patient's needs and communicating acceptance, reassurance, and a sense that the environment is safe. Procedures routine in dentistry such as taking the blood pressure, administering a local anesthetic or the application of a rubber dam may arouse intense anxiety or irrational behavior in a patient who has not been forewarned. Explaining procedures before performing them, smiling, making direct eye contact and gently touching the patient all help to convey the appropriate cues. Simplicity of verbal communications is paramount. Short words and sentences; nouns rather than pronouns; repetition as frequently as necessary are helpful rules to remember.

f. Aggressive preventive modalities are required to ensure maintenance of oral health. A clinical examination, oral prophylaxis and professional application of fluoride gel (greater than or equal to 10,000 ppm F) are performed at 3-month recall visits. Home

care providers are instructed in daily use of commercially available fluoride dentifrices with greater than or equal to 1,000 ppm F or 0.4 percent SnF2 gel (Tin-Gel or Gel-Kam). Correction of defects in the natural dentition or prosthetic replacement are also performed during these recall visits. Oral hygiene education is reviewed with the home-based caregiver.

g. It is vitally important to provide in-service educational programs to the non-dental members of the health care team. An educated team will request appropriately-timed consultations if a problem arises between dental appointments. Properly motivated and trained nurses and nursing assistants can provide excellent oral hygiene care.

h. The treating dentist should consult the primary care physician to obtain an opinion as to the patient's medico-legal competence to give consent for proposed care.

(d) **Followup.** Appropriate followup appointments with the patient's primary physician must be assured for all psychiatric protocol patients undergoing dental treatment. The responsible physician should be notified when planned dental treatment has been completed. Any post-treatment coordination deemed necessary is a joint responsibility of the treating dentist and the physician.

REFERENCES

1. 38 U.S.C. 610(C)(2)(A)

2. 38 U.S.C. 610(C)(2)(B)

3. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, ed. 3 Washington, DC, 1980, American Psychiatric Association.

4. Rose, L.F. and Kay D.: Internal Medicine for Dentistry, St. Louis, 1983, the C.V. Mosby Company.

5. Little, W.J. and Falace D.A.: Dental Management of the Medically Compromised Patient, St. Louis, 1984, C.V. Mosby Company.

6. Blank, A.S.: Apocalypse Terminable and Interminable: Operation Outreach for Vietnam Veterans. Hospital and Community Psychiatry, 33, 100-101, 1982.

7. Walker, J.I.: The Psychological Problems of Vietnam Veterans. JAMA 246:781-782, 1981.

8. Lipton, M.I. and Schaffer, W.R.: Post Traumatic Stress Disorder in the Older Veteran. Military Med. 1986; 151:522-524.

9. Friedlander, A.H., Mills, M.J.U. and Wittlin, B.J.: Dental Management Considerations for the Patient with Post-Traumatic Stress Disorder. Oral Surg 1987;63:669-673.

10. Yagiela, Jr., Duffin, S.R. and Hunt, L.M.: Drug Interactions and Vasoconstrictors Used in Local Anesthetic Solutions. Oral Surg 1985; 59:565-571.

11. Niessen, LC and Jones, J: Alzheimer's disease: a guide for dental professionals. Special Care in Dentistry. Jan-Feb 1986, pp. 6-12.

j. **Guidelines For Dental Involvement in the Management of Patients With Substance Abuse Problems**

(1) **Background/Rationale**

(a) VA may provide sound, medically coordinated dental treatment that has a direct bearing on the substance abuse problem for which a patient is currently hospitalized. This care may be provided to outpatients within existing resources, providing current legislative entitlements and other treatment priorities are not compromised.

(b) Alcohol abuse encompasses both the pathologic use of alcohol and the related impairment in social or occupational functioning. Pathologic use of alcohol is not determined by the amount of alcohol consumed but by the inability to control or reduce excessive drinking. Continued drinking despite psychosocial or medical problems that are acknowledged to be worsened by drinking is an example of pathologic use. Impaired functioning from alcohol use may precipitate violence while intoxicated, absence from work, loss of job, legal difficulties, or arguments with family or friends.

1. Alcohol dependence includes the additional feature of physical dependence on alcohol that is reflected by either tolerance or withdrawal. Tolerance is a decrease in a person's sensitivity to alcohol because of previous use, and it is shown by the need to drink increased amounts to get the same effect. Withdrawal is the physiological and psychological syndrome which develops 6 to 8 hours after cessation or reduction in heavy, prolonged alcohol intake and is due to the direct effects of alcohol on the central nervous system. It is manifested by a coarse tremor of the hands, usually accompanied by malaise or weakness, anxiety, irritability, depression, and autonomic hyperactivity, such as tachycardia, elevated blood pressure, or sweating.

2. Prolonged heavy alcohol intake may result in cognitive impairment, even when a person is sober. In the "alcohol amnestic disorder" (Korsakoff's syndrome), even though other intellectual abilities remain intact, a person is unable to learn any new material (anterograde amnesia). In "dementia associated with alcoholism," there is a general loss of intellectual abilities severe enough to interfere with social or occupational functioning. The deficits involve not only memory, as in the amnestic disorder, but also involve abstract thinking, language, and judgment and are often associated with personality changes.

(c) DSM III (The Diagnostic and Statistical Manual of Mental Disorders, third edition), the official publication of the American Psychiatric Association, provides diagnostic criteria for describing drug-dependent patients. It defines a "substance use disorder" as the pathologic behavior of persons as they relate to self and society while abusing a substance that affects the central nervous system. Examples of such behavioral changes include impairment in social or occupational functioning as a consequence of substance use, inability to control use of or to stop taking the substance, and the development of serious withdrawal symptoms after cessation of or reduction in substance use.

1. Substance use disorders are subdivided into "abuse" and "dependence" categories. "Abuse" is defined as a pattern of pathologic behavior of more than 1 month's duration, consisting of intoxication throughout the day or the need for daily use of the substance for adequate functioning. Maladaptive behavior frequently interferes with social or

occupational functioning. "Dependence" is defined as a more severe problem, and inclusion in this category requires that the individual manifest symptoms of either "tolerance" or "withdrawal". The major symptom of tolerance is a need for markedly increased amounts of the substance to achieve the desired effect. The major symptoms of withdrawal are the physiological and psychological manifestations that a person develops following cessation of drug usage (e.g., automatic hyperactivity, changes in mood, and sleep disturbances.)

2. Barbiturates, minor tranquilizers such as benzodiazepines, diazepam (Valium), and oxazepam (Serax), or hypnotics such as chloral hydrate, and methaqualone (Quaalude) may cause the user, during periods of intoxication, to manifest mood lability, disinhibition of sexual and aggressive impulses, slurred speech, impaired memory, and maladaptive behavior effects (impaired judgement, interference with social or occupational functioning, and failure to meet responsibilities). After prolonged use, the user may develop an "amnestic disorder" characterized by short-term memory impairment (the inability to learn new information) or long-term memory impairment (the inability to remember information that was known in the past). Upon withdrawal, the patient may exhibit nausea, vomiting, autonomic hyperactivity (e.g., tachycardia, sweating, elevated blood pressure), mood changes, and coarse tremors of the tongue and eyelids.

3. The opioids such as heroin, morphine, meperidine, and methadone cause the user, during periods of intoxication, to manifest pupillary constriction (or dilation due to anoxia from an overdose), euphoria, apathy, drowsiness, slurred speech, impaired attention or memory, and maladaptive behavior. Upon withdrawal, the user may exhibit pupillary dilation, autonomic hyperactivity, lacrimation, rhinorrhea, diarrhea, fever, and insomnia.

4. Cocaine may cause the user, during periods of intoxication, to manifest a set of psychological symptoms that include a sense of well-being (euphoria) and confidence, a heightened awareness of sensory input, elation, grandiosity, loquacity, and pressured speech. Maladaptive behavior may also be present. The physical symptoms of cocaine intoxication include pupillary dilation, nausea, vomiting, and autonomic hyperactivity. Current research has failed to identify a uniformly documented withdrawal syndrome.

5. Amphetamines, dextroamphetamine (Dexedrine), methamphetamine ("speed"), and some appetite suppressants ("diet pills") may cause the user, during periods of intoxication, to manifest a clinical picture similar to that of cocaine intoxication. On occasion, within 24 hours of administration of amphetamine, delirium may develop. During episodes of "amphetamine delirium," the user has a clouded state of consciousness with difficulty in sustaining attention, sensory misperceptions (illusions, hallucinations), incoherent speech, and disordered thought. Also, there may be disturbance of the sleep-wakefulness cycle, with nocturnal insomnia and daytime drowsiness. An additional complication that may recur after longtime use of high dosages, an "amphetamine delusional disorder", may develop. During these episodes, there is a normal state of consciousness with the person expressing persecutory delusions, ideas of reference (an incorrect interpretation of casual incidents and external events as having direct reference to one's self), and potentially aggressive or violent action against "enemies." These patients are frequently anxious and exhibit psychomotor agitation. Upon withdrawal, the person may be severely depressed (with agitation or suicidal ideation), have a disturbed sleep (with increased dreaming), and experience chronic fatigue.

6. PCP (Phencyclidine) ("angel dust") generally causes the user, during periods of intoxication, to manifest vertical or horizontal nystagmus, an increased blood pressure

and heart rate, increased salivation, facial grimacing, emotional lability, euphoria, and maladaptive behavior (belligerence, impulsiveness, unpredictability, impaired judgement, and assaultiveness). Episodes of "phencyclidine delirium" are similar to those seen in "amphetamine delirium." Phencyclidine withdrawal states have not yet been identified.

7. Cannabis (marijuana, hashish) may be smoked or taken orally. It may cause the user, during periods of intoxication, to manifest a marked sense of well-being and relaxation, an intensification of perceptions (a preoccupation with auditory and visual stimuli), and a sensation of slowed time in which 10 minutes may seem like an hour. The person is frequently indifferent to his surroundings (apathy). Physical signs include a tachycardia (a pulse rate in excess of 100), conjunctival injection, xerostomia, and an increased appetite for "junk" food (highly cariogenic). The existence of a cannabis delusional disorder is controversial, but it has been described by some investigators as not persisting beyond a few hours. In it, the person displays maladaptive behavior brought about by paranoid ideation (persecutory delusions or delusional jealousy), panic attacks, and dysphoria (dissatisfaction, anguish, anxiety, and restlessness). On occasion, the person believes that he is about to either die or become crazy. A cannabis withdrawal state has not been identified.

(d) Six percent of all VA hospitalized patients have a drug abuse problem (other than alcohol). For those under age 35 (Vietnam era veterans), the incidence rises to 29 percent and studies have shown that more than four in five narcotic addicts abuse alcohol as well.

1. The prevalence and severity of dental disease among patients with drug and chemical dependence is in part explained by the lack of prehospitalization dental care. The financial outlay necessary to support the dependency habit negatively impacts upon the patient's ability to afford appropriate and timely care. In addition, dental practitioners in the private sector, frequently lack the adjunctive medical, social and psychiatric support services necessary to appropriately deal with these patients.

2. Unemployment, family disaffiliation, lower educational attainment and legal problems are very common and among this group of patients. Thus, they present with marginal social adjustment and often with monumental, previously unmet, dental health care needs. Their poor quality of dental health is superimposed upon the progressive deleterious effects of the dependency habit on systemic health.

(e) Cocaine abuse is defined as a mental disorder when there is both pathologic use and an impairment in social or occupational functioning. Pathologic use is not defined by the amount of the drug which is consumed, but by the inability to reduce or stop its use, or frequent intoxication throughout the day. Impaired functioning from cocaine use may include psychosis or violence while intoxicated, absence from work, loss of job (or poor performance as a student or homemaker), legal difficulties, financial problems, or conflicts with family or friends. Frequent or high dose use of cocaine is often associated with severe psychotic states indistinguishable clinically from an acute schizophrenic or manic episode.

1. Cocaine increases heart rate and blood pressure. It also causes small vessel vasoconstriction, by stimulating norepinephrine release from vascular wall sympathetic nerve endings and inhibiting norepinephrine re-uptake. Coronary artery vasoconstriction in response to cocaine has been demonstrated in animal experiments. The combined

cocaine effects of increased myocardial oxygen demand and decreased coronary artery perfusion may lead to significant myocardial ischemia, with resultant angina or myocardial infarction. Cocaine's sympathomimetic effects combined with the increased cardiac workload, may also predispose to cardiac arrhythmia. There are increasing reports of acute cardiac events (myocardial infarction, ventricular tachycardia, aortic rupture) associated with usual doses, even in patients without apparent pre-existing cardiac disease.

2. Cocaine's combined effects on central nervous and cardiovascular systems may result in anxiety symptoms resembling a "panic attack." Such patients may present with chest pain, tachycardia, palpitations, tachypnea, dyspnea, hyperventilation, diaphoresis and anxiety. These individuals often believe they are having a "heart attack." Cocaine addicts frequently abuse a second drug, usually a CNS depressant (e.g. alcohol or benzodiazepines) which tempers the stimulant effects of cocaine.

3. Cocaine abuse treatment usually involves group and family therapy, with emphasis on education and supportive psychotherapy to help the patient over-come denial and adjust to a drug-free lifestyle. Most treatment programs strongly encourage participation in a peer self-help group such as Cocaine Anonymous (which is modeled on Alcoholics Anonymous). Some programs also use behavior modification techniques such as "contingency contracting."

4. Some treatment centers supplement psychosocial approaches with medication, thereby hoping to reduce symptoms of cocaine withdrawal and craving. Medications used include lithium, anti-depressants such as imipramine (Tofranil), desipramine (Norpramin), or trazodone (Desyrel), and dopaminergic drugs such a bromocriptine (Parlodel), amantadine (Symmetrel), and L-dopa/carbidopa (Sinemet). During acute cocaine intoxication, neuroleptics such as haloperidol (Haldol) can be useful in controlling psychotic symptoms, and beta-adrenergic blockers such as propranolol (Inderal) can reduce severe sympathetic symptomology (e.g. tachycardia, hypertension).

(2) **Protocol Recommendations**

a. **Responsibilities**

1. All members of the medical staff involved in the primary care of patients with substance abuse problems must assure that, through routine examination or consultation referral, these patients will have the opportunity to be evaluated by the Dental Service.

2. Examining dentists are responsible for the identification and evaluation of oral problems and, with the primary care physician, for assessing the correlation of these problems (or treatment thereof) with their substance abuse problems.

3. The Chief, Dental Service, or designee, is responsible for determinations regarding eligibility, prioritization and extent of care, as well as the overall supervision of the dental component of treatment.

4. Each treating dentist is responsible for the dental management of patients assigned, coordination with the primary care physician, and the actual delivery of dental care.

(b) **Procedures**

1. Patients with the following disorders will be identified as protocol patients:

a. Alcohol dependence.

b. Drug/chemical dependence.

c. Cirrhosis/alcoholic hepatitis.

d. Alcohol induced organic brain syndrome.

e. Patients admitted to the hospital for other reasons but who have substance abuse as a secondary diagnosis .

2. The following mechanisms will be used by the Dental Service to access protocol patients:

a. Oral examinations and medical record reviews conducted on newly admitted inpatients.

b. Medical history reviews performed on previously unexamined inpatients and eligible outpatients undergoing elective or emergent care in the dental clinic.

c. Consultation requests from appropriate services or clinics; i.e., medicine, mental hygiene, psychiatry, etc.

3. Evaluation and formulation of specific dental treatment recommendations will be guided by the following:

a. Protocol patients must be carefully selected; based only upon a direct relationship of their substance abuse problem with their oral needs. Resource limitations will not permit treatment of all patients with these diagnoses. Decisions regarding dental care must be based on sound judgements reached by close coordination between the Dental Service and those professional services responsible for the medical and/or psychiatric care.

b. Care must be exercised by all members of the treatment team to guard against raising the expectations of patients with regard to dental care. Examinations by the Dental Service must be considered part of the admission physical evaluation and patients must be made aware that interrelationships with their medical/psychiatric problem determines whether or not dental treatment will be provided and, even for those selected on that basis, the treatment may be limited to the most urgent needs and/or that which directly affects their substance abuse problems.

c. A comprehensive oral examination and specific treatment recommendations should be completed following identification of a protocol patient. A summary of the dental findings and treatment recommendations will be provided either as a progress note or as a consultation response.

d. Dental treatment recommendations will be formulated according to acceptable dental practices with specific consideration for the patient's stage of therapy, risk factors, restrictions, limitations, and prognosis. Patients diagnosed as having substance abuse problems must be judged individually on the basis of the severity of disease and

relationship to contemplated dental procedures. For patients who are in an extended care program and for whom dental care is viewed as having a positive impact on the patient's self-image and. ultimately, successful completion of the program, the benefits of a hospital milieu and a hospital trained dentist can be significant.

e. Unless the veteran has statutory entitlement to comprehensive outpatient dental care, the dental treatment provided to VA inpatients will be limited to that which is:

(1) Professionally defensible as essential to the treatment of their medical/psychiatric problem;

(2) Emergent (pain, trauma, hemorrhage or acute infection);

(3) Needed to maintain reasonable health and nutritional viability in patients whose degree of medical/psychiatric disability or risk requires that dental care be provided within the hospital;

(4) Needed to maintain reasonable health, nutritional viability and quality of life in long-term patients (over 100 days of hospitalization).

f. Results of the dental examination will be recorded on VA Form 10-7978f or other approved oral exam form. The patient's primary care physician will be advised of the dental findings and treatment recommendations via telephone and/or progress note. Countersignature of the dental treatment plan will be requested.

4. Wherever and whenever feasible, the Dental Service should have close communication with the professional staff responsible for the planning conferences for substance abuse patients. Dental evaluation and tentative treatment plans will be prepared for patients identified as appropriate for this protocol. Patients' dental needs will be correlated with the planned medical/ psychiatric care to minimize interruptions of primary therapy and to avoid scheduling conflicts.

5. The following considerations by a treating dentist are required prior to initiation of care:

a. For inpatients, current status including history, symptoms, diagnosis, physical examination, current labs, special studies, current medications, and the recommendations of the primary care physician will be documented prior to dental treatment. It is imperative that the physician be briefed on the type and extent of dental treatment planned and any anticipated complications so that proper coordination with the patient's therapeutic plan can be accomplished.

b. Stable outpatients with acute dental pain or infection may be managed prior to physician consultation. Only the minimum intervention required to control the acute situation will be provided. The safety and well-being of the patient will receive the highest priority. Any further treatment of the patient's dental needs will be deferred until the physician can be consulted.

c. Outpatients receiving care for their substance abuse problem will receive dental treatment only upon referral from the program's coordinating physician and as allowed by current eligibility regulations.

d. Should the patient be hospitalized for dental treatment, the following criteria will usually be applied:

(1) If the primary indication for the hospitalization is substance abuse, the patient will be admitted to either Medical Service or to Psychiatry Service, with Dental Service consulting.

(2) If the primary indication for the hospitalization is the dental problem, the patient will be admitted to the Dental Service, with Medical Service/Psychiatry Service consulting.

6. Coordination of treatment is a joint responsibility of the dentist and the primary care physician, and will be guided by the following:

a. Special restrictions and applicable information on medications or management of the patient's medical/psychiatric condition should be coordinated via direct or telephone contact between dentist and primary care physician.

b. The primary care physician should be notified of any modifications in the dental treatment plan and any use of prescription drugs in the course of dental care.

(c) **Management Guidelines.** The following information is provided primarily for dentist members of the medical staff to serve as guidelines in considering and delivering dental care to patients with substance abuse problems:

1. **Alcoholism.**

a. Alcoholics frequently manifest a number of the following oral findings:

(1) Poor oral hygiene.

(2) Increase in DMF rate (decayed/missing/filled teeth).

(3) Xerostomia.

(4) Advanced generalized periodontitis.

(5) Dental attrition secondary to bruxism.

(6) Increased incidence of oral cancer.

(7) Angular cheilitis.

(8) Oral ulcerations.

(9) Glossitis.

The marginal socioeconomic status of many alcoholics limits their ability to obtain appropriate and timely dental care. Thus, they often have severe, previously unmet dental care needs. Their poor oral health is superimposed upon the deleterious effects of alcohol upon systemic health. To further compound the problem, dentists in the private sector frequently lack the interest or benevolence as well as adjunctive medical, psychiatric, and social support services necessary to care for these patients.

b. **Systemic Derangement seen in Alcoholism**

(1) From the perspective of dentistry, the important organs that may be affected in alcoholism are the liver and the bone marrow. In order to obtain proper hemostasis, the liver must synthesize the many proteins involved in the coagulation cascade. Patients with severe alcoholic liver disease may have deficient protein levels, causing impaired clotting and increased risk of intraoperative or postoperative hemorrhage. The bone marrow manufactures platelets. Alcohol may act as a direct marrow suppressant, potentially causing thrombocytopenia and a resultant prolonged bleeding time.

(2) Long-term alcoholics have abnormally low total protein and/or albumin levels, interfering with the proper formation and deposition of collagen thus prolonging the postoperative healing process and increasing the risk of postoperative infection. It also suppresses the bone marrow's production of leukocytes. In addition, these leukocytes, may lack appropriate chemotactic activity and function at less than optimum efficiency. Both cellular and immunologic defense mechanisms are adversely affected. Long-term alcoholics appear to heal more slowly after oral surgery and are more susceptible to an osteomyelitis of the mandible after sustaining a compound fracture.

c. **Laboratory Testing in the Alcoholic Patient**

The examination should include the following blood tests: CBC with differential and platelet estimation, PT, PTT, total protein, albumin, and liver transaminases (SGOT, SGPT, GGTP). When patients have clinically significant test abnormalities, invasive dental procedures should be delayed until re-evaluation by their physicians.

d. Alcoholic compromise of liver function may result in altered metabolism of certain drugs. Listed below are commonly used dental medications that are primarily metabolized by the liver. The treating dentist should consult with the patient's physician to determine the appropriate dosages, based on the patient's residual liver function.

(1) Local anesthetics (amide class).

(a) Lidocaine (Xylocaine).

(b) Mepivacaine (Carbocaine).

(2) Antibiotics.

(a) Ampicillin.

(b) Tetracycline.

(3) Analgesics.

(a) Salicylates/aspirin.

(b) Acetaminophen (Tylenol).

(c) Codeine.

(4) Sedatives.

(a) Diazepam (Valium).

(b) Chlordiazepoxide (Librium).

(c) Barbiturates.

e. Acetaminophen is usually selected over aspirin as the preferred analgesic for the alcoholic patient prone to develop gastritis. But a recent report has documented the development of severe hepatocellular disease in chronic alcoholics using acetaminophen in doses accepted to be in or near the therapeutic range. Alcoholics who are continuous heavy drinkers should be informed of the potential dangers of both acetaminophen and salicylates.

f. The use of the ester class of local anesthetics for patients with alcoholic cirrhosis has been recommended because of their more predictable rate of metabolism. Propoxycaine hydrochloride 0.4 percent (Ravocaine) combined with procaine hydrochloride 2 percent (Novocaine) is available in 1.8 ml dental cartridges. These para-aminobenzoic acid esters are rapidly metabolized through hydrolysis by plasma cholinesterase, and less metabolism occurs in the liver than with the amide class of local anesthetic agents.

(1) Special restrictions and applicable information on medications or management of the patient's condition should be coordinated via direct contact or telephone.

(2) The primary care physician should be notified of any modifications in the dental treatment plan and any use of prescription drugs in the course of dental care.

2. **Drug and Chemical Addiction**

a. Epidemiologic studies of patients with chemical and drug dependency habits have documented that these persons tend to consume large quantities of refined carbohydrates, with a consequently high caries rate. A drug-induced xerostomia may precipitate rampant dental decay and numerous abscessed teeth. Addicts commonly manifest an increased incidence of advanced generalized periodontitis and a high rate of dental attrition secondary to bruxism.

b. In patients with long-term substance abuse, there is frequently a reduced tolerance to pain. These same patients tend to be manipulative and devise schemes to encourage practitioners to prescribe narcotic analgesics. Dentists must evaluate the patient for both real and imagined causes of pain. If one is unable to discern a probable cause of pain, a consultation with the patient's psychiatrist may be helpful in appropriately evaluating the patient who presents with seemingly irrational symptoms (factitious pain).

c. If there is an objective need for dental treatment, the following considerations must be addressed and care coordinated with the patient's physician:

(1) Patients who abuse intravenous substances frequently share contaminated needles and syringes and are at risk for infectious hepatitis, AIDS, or ARC. It is mandatory prior to the institution of dental care to obtain the HbsAg (hepatitis B surface antigen) screening test and to evaluate the patient for signs and symptoms of AIDS or ARC. Patients who have a positive screening test for hepatitis or those who give a history consistent with AIDS/ARC will require further evaluation by their physician.

(2) Non-sterile needles that carry the hepatitis virus may also carry other contaminants. As the needle enters the vein, the blood returning to the right side of the heart will be involved and the contaminants may eventually damage the tricuspid valve

that lies between the right atrium and the right ventricle. Thus, all patients with a history of intravenous drug abuse should be evaluated by their physician for organic cardiac valvular disease. If so identified, they are at increased risk of developing infectious endocarditis because of the bacteremia that often occurs during dental procedures. Guidelines established by the American Heart Association to minimize or prevent endocarditis are applicable to these patients.

(3) Patients who abuse intravenous drugs frequently demonstrate an inordinate fear of dental needles and syringes. Nevertheless, local anesthesia is the safest method of obtaining intraoperative pain relief.

(4) Relief of postoperative dental pain requires close coordination among the treating dentist, the physician, and, of course, the patient. Patients with a long history of substance abuse and a low pain threshold frequently require that pain medication be dispensed in doses in excess of the standard range. Certain pain medications may interfere with methadone maintenance schedules or, on occasion, may introduce the potential of a withdrawal problem. The danger of the patients developing a new addiction in the postoperative phase must also be considered.

(5) Dentistry has a responsibility to reduce oral disease in these patients. An esthetic and biologically sound restoration of the orofacial structures may improve long-term rehabilitation by enhancing self-esteem and social interactions.

3. **Cocaine Abuse**

a. Patients addicted to cocaine frequently exhibit the following oral findings:

(1) Cocaine induced anorexia contributes to weight loss and malnutrition and increased incidence of the following:

(a) Angular cheilitis.

(b) Oral candidiasis.

(c) Glossodynia.

(2) Cervical abrasion.

(3) Gingival lacerations.

(4) Severe bruxism, with resultant:

(a) Temporomandibular joint disturbances.

(b) Dental attrition.

(5) Patients with combined cocaine and alcohol abuse tend to present with the most severe dental complications such as:

(a) Severe xerostomia.

(b) Advanced periodontitis.

(c) Many decayed teeth.

(d) Many missing teeth.

(e) Severe dental attrition from bruxism.

b. Some medical complications of cocaine abuse are specific to the particular route of administration. IV (Intravenous) cocaine users, like other IV drug users, frequently share contaminated needles and syringes, and the pre-treatment and treatment precautions relating to Hepatitis, HIV infection, and endocarditis noted in paragraphs (2)(b) 1 and 2 are applicable.

c. Habitual "snorting" of cocaine can produce irritation and atrophy of the nasal mucosa, and a decreased sense of smell is not uncommon. A runny or clogged nose is also a frequent occurrence, causing some patients to chronically use a nasal decongestant spray. Prolonged intranasal cocaine administration can lead to mucosal ulcerations, nosebleeds, and nasal septum perforations. These patients frequently complain of a maxillary sinusitis which may be demonstrable on a panoramic dental x-ray. Differentiation between facial pain caused by odontogenic pathology, sinus pathology or a combination of both is often a challenging task. These patients should not be considered candidates for surgical correction of dento-facial deformities unless their nasal mucosa, nasal septum and maxillary sinuses are healthy.

d. Some patients have reported the development of pruritic rash on their chest after I.V. cocaine administration. This may represent an allergic reaction. Because cocaine is a cenzoic acid ester, there is the potential risk for an allergic reaction in this group of patients to the ester class of local anesthetics, e.g. propoxycaine hydrochloride 0.4 percent (Ravocaine) combined with procaine hydrochloride 2 percent (Novocaine). These patients are most safely treated with the amide class such as lidocaine hydrochloride (Xylocaine) or mepivacaine hydrochloride (Carbocaine).

e. If a patient has taken cocaine on the day of a planned dental procedure, the procedure must be postponed for at least 6 hours. Peak blood levels of the drug develop within 30 minutes and most of the drug disappears after 2 hours, except when the intranasal route of administration is used. In that case, mucosal vasoconstriction may cause a slower release of the drug into the systemic circulation. Consequently, a cocaine drug effect is possible for as long as 4 to 6 hours. Extra caution is needed in the use of local anesthetic solutions containing epinephrine, because cocaine potentiates the response of sympathetically innervated organs. Thus, there exists the possibility of a dangerous potential interaction between cocaine and epinephrine which might result in a severe hypertensive crisis and cerebrovascular accident.

f. Consultation between the dentist and the physician is required for all dental patients currently enrolled in a cocaine treatment program. The dentist must be assured of the patient's abstinence from cocaine, and informed of any medications being taken by the patient which might interact with dental therapeutics. For those patients enrolled in drug-free programs, there must be an agreement beforehand among the patient, the physician and the dentist as to the appropriate method for managing post-operative dental pain. Even when permitted by the treatment program, narcotic analgesics should be prescribed cautiously and in limited quantities because of their potential for abuse.

(d) **Followup**. Appropriate followup appointments with the patients primary physician must be assured for all substance abuse protocol patients undergoing dental treatment. The responsible physician should be notified when planned dental treatment has been completed. Any post-treatment coordination deemed necessary is a joint responsibility of the treating dentist and the physician.

REFERENCES

1. 38 U.S.C. 610(C)(2)(A)

2. 38 U.S.C. 610(C)(2)(B)

3. Friedlander A.H.: Alcoholism and Dental Management. Oral Surg 63:42-46, 1987.

4. Rose, L.F. and Kay D.: Internal Medicine for Dentistry, St. Louis, MO, 1983, The C.V. Mosby Company.

5. Little, W.J. and Falace, D.A.: Dental Management of the Medically Compromised Patient, St. Louis, MO, 1984, C.V. Mosby Company.

6. Jelinek, M.J. and Williams, T.: Post-Traumatic Stress Disorder and Substance Abuse in Combat Veterans: Treatment Problems, Strategies and Recommendations, J. Subs. Abuse Treatment 1984; 1:87-97.

7. Friedlander, A.H. and Mills, M.J.: The Dental Management of the Drug-dependent Patient. Oral Surg Oral Med Oral Path 60:489-492, 1985.

8. Schevz F.: Five Year Evaluation of Dental Care Delivery System for Drug Addicts in Denmark, Comm. Dent. Oral Epidemol. 12:29-34, 1984.

9. Friedlander, A.H., Jills, M.J.U., and Wittlin B.J.: Dental Management considerations for the Patient with Post-Traumatic Stress Disorder. Oral Surg 1987;63:669-673.

10. Yagiela, J.A., Duffin, S.R., and Hunt L.M.: Drug Interactions and Vasoconstrictors Used in Local Anesthetic Solutions. Oral Surg. 1985; 59: 556-571.

k. **Guidelines for Dental Involvement in the Management of Physically Handicapped Patients.**

(1) **Background/Rationale**

(a) The problem of providing dental care to handicapped Americans is mirrored in the challenge faced by the VA Dental Service as it fulfills its responsibilities to the Nation's veterans. Patients with physical handicaps often have difficulty in communication, limited tolerance for postural changes, marked problems with mobility and access, and may require specially designed equipment for dental care. Provision of needed dental treatment for some of these patients may be justified on the basis of length of hospitalization, service-connection, or because the condition requires treatment in a hospital environment. In any case, inadequate pretreatment evaluation and dental treatment without consideration for the patient's physical limitations are associated with unsuccessful results and an increased potential for morbidity. Oral hygiene and preventive dentistry needs in this group are large, since self-care by these patients is often limited and only marginally effective.

(b) Primary prevention plans should be developed for all of these patients. Ward personnel and, when possible, family caregivers should receive proper training in the development of daily oral hygiene programs. Since most of the patients in this category are cognitively alert, as much responsibility as possible for oral health care should be

delegated to the patients themselves. Even when physically incapable of performing some tasks, they are still capable of soliciting assistance if they are knowledgeable about their own needs. Informed patients are often the most effective advocates for their own care. In many instances, however, ward personnel or the caregiver may actually have to accomplish the hygiene procedures for the patient.

(c) The compromised general status of handicapped patients, the likelihood for their continuing decline in cooperation and cognition, and the likelihood of impaired hygiene and medication-induced xerostomia, dictates that the level of restorative care delivered to these individuals be of the highest quality. Efforts should be made to treat patients in the dental clinic where they can be transferred into the dental chair thus allowing the clinician to have optimal access, lighting, and armamentarium. Coordination between the Dental Service and all rehabilitative Services of the medical center is in the best interests of the patients involved.

(2) **Protocol Recommendations**

(a) **Responsibilities**

1. All members of the medical staff involved in the primary care of patients with physical handicaps specified in this protocol must assure that, through routine examination or consultation referral, those patients have the opportunity to be evaluated by the Dental Service.

2. Examining dentists are responsible for the identification and evaluation of oral problems and, with the primary care physician, for assessing the correlation of those problems (or treatment thereof) with the physical handicap, degree of disability, and ability of patients to maintain their own oral health.

3. The Chief, Dental Service, or designee, is responsible for determinations regarding eligibility, prioritization and extent of care, as well as the overall supervision of the dental component of treatment.

4. Each treating dentist is responsible for dental management of patients assigned, coordination with the primary care physician, and the actual delivery of dental care.

5. The Chief, Dental Service, will assure that all members of the Dental Service involved in the treatment of physically handicapped patients have received adequate training in the special skills required for their management.

(b) **Procedures**

1. Patients with the following physical handicaps will be identified as protocol patients:

a. Blindness.

b. MS (Multiple Sclerosis).

c. Degenerative nervous system disorders.

d. Spinal disorders and injuries.

e. Amputations.

f. S/P (status/post) CVA (Cerebrovascular accident).

g. Rheumatoid arthritis.

h. Hearing impairment.

i. General frailty.

2. The following mechanisms will be used by the Dental Service to identify patients having physical handicaps:

a. Oral examinations and chart reviews conducted on newly admitted inpatients.

b. Medical history reviews performed on previously unexamined inpatients and on eligible outpatients undergoing care in the dental clinic.

c. Consultation requests from appropriate services or clinics; i.e., Rehabilitation Service, Medicine, Neurology, Geriatrics, etc.

3. Retrospective review of the daily G&L sheets for patients admitted to rehabilitative wards and review of special procedure schedules may be used as quality assurance measures.

4. Completion of a comprehensive dental evaluation and formulation of specific treatment recommendations will be guided by the following:

a. A comprehensive oral examination and specific treatment recommendations should be completed following identification of a protocol patient. A summary of the dental findings and treatment recommendations will be provided either as a progress note or as a consultation response.

b. Dental treatment recommendations will be formulated according to acceptable dental practice with specific consideration for the patient's physical disability, risk factors, restrictions, limitations, level of neurologic deficit, and prognosis. Generally speaking, many of the long-term SCI (Spinal Cord Injury) patients require early and continued dental surveillance and should be given high priority in this protocol category. Patients with other physical disabilities, such as arthritis or S/P CVA patients, must be judged individually on the basis of the nature and degree of disability relative to the contemplated dental procedure. For example, a patient with well-controlled arthritis should be able to see a private dentist or be treated on an outpatient basis (as eligible) for most dental procedures. However, patients who are 3 months post-CVA and unable to care for themselves, may require the benefit of a hospital milieu and a hospital trained dentist to reduce the risks involved with a needed extraction or other dental procedures.

c. Unless the veteran has statutory entitlement to comprehensive outpatient dental care, the dental treatment provided to VA inpatients will be limited to that which is:

(1) Professionally defensible as essential to the treatment of their medical problem,

(2) Emergent (pain, trauma, hemorrhage or acute infection),

(3) Needed to maintain reasonable health and nutritional viability in patients whose degree of medical disability or risk requires that dental care be provided within the hospital,

(4) Needed to maintain reasonable health, nutritional viability and quality of life in long-term patients (over 100 days of hospitalization).

d. Dental findings and treatment recommendations will be recorded on VA Form 10-7978f or other approved oral exam form. The patient's primary care physician will be advised of the dental findings and the dental recommendations regarding patient management via telephone and/or a progress note. Countersignature of the dental treatment plan will be requested.

5. Wherever and whenever feasible, there should be active participation in Rehabilitation Medicine (or other appropriate Service) treatment planning conferences by a designated member of the Dental Service. A dental evaluation and tentative treatment plan will be prepared for each patient presented. The patient's dental needs will be correlated with the rehabilitation treatment plan to hold delays to a minimum, decrease risks, and reduce potential morbidity which might result from uncoordinated treatment.

6. The following considerations by a treating dentist are required prior to initiation of care:

a. For inpatients, a current medical status including history, symptoms, diagnosis, physical examination, current labs, special studies, current medications, and the recommendations of the primary care physician will be fully documented prior to dental treatment. It is imperative that the primary care physician is briefed on the type and extent of dental treatment planned and any anticipated complications so that proper coordination with the patient's therapeutic plan is accomplished.

b. Stable, physically handicapped outpatients with acute dental pain or infection may be managed prior to physician consultation. Only the minimum intervention required to control the acute situation should be provided. The safety and well-being of the patient will receive the highest priority. Any further treatment of the patient's dental needs should be deferred until the primary care physician can be consulted.

c. When the patient is to be hospitalized for dental treatment, the following criteria will usually be applied:

(1) If the primary indication for the hospitalization is the physical disability, the patient will be admitted to Rehabilitation Medicine or other appropriate Service, with Dental Service consulting.

(2) If the primary indication for the hospitalization is the dental problem, the patient will be admitted to the Dental Service, with Rehabilitation Medicine or other appropriate Service consulting.

7. Coordination of treatment is a joint responsibility of the dentist and the primary care physician and will be guided by the following:

a. The timing and sequencing of dental and medical treatment are critical for certain rehabilitation regimens. Dental treatment should be scheduled so as to be coordinated with daily nursing care and other therapeutic activities.

b. Cautions relating to special restrictions, adjustments of medication, and management of the patient's physical condition will be provided by the primary care physician via direct contact or telephone.

c. Modifications in the delivery of dental care will be coordinated by the treating dentist following consultation with the primary care physician.

d. There is a group of patients who, for a variety of reasons, cannot be treated in the conventional manner or in a clinic setting. Consideration should be given to performing needed dental treatment in one visit through the use of general anesthesia in the O.R. (Operating Room).

8. Vital signs will be recorded for all protocol patients before and after each dental treatment appointment.

(c) **Management Guidelines.** The following information is provided primarily for dentist members of the medical staff to serve as guidelines in considering and delivering dental care to patients with various physical handicaps:

1. **Blindness**

a. Blind patients cannot perceive visual clues, and should be advised of what the dentist is about to do, and what to expect while it is being done. For example, "I am going to put my mirror into your mouth, so that I can see better. It will feel cold inside your cheek and I am going to pull on your lip a bit. I am going to start now, so open your mouth."

b. Blind patients are not hearing impaired and should be addressed in a normal tone of voice. All relevant dialogue should be directed to the patient.

c. Generally speaking, blind patients have an increased sense of touch. This should be utilized to make the patients feel more comfortable in the operatories and more amenable to planned and actual treatment procedures.

d. When guiding a blind patient, avoid the tendency to push the person in the direction you want them to go. Instead, offer your arm. The sight impaired person will hold or touch your arm and will follow your lead. When entering an area of potential obstacles, such as a dental treatment area, describe the objects with which the patient may come in contact so they can be avoided.

e. When the blind patient uses a guide dog, avoid interfering with the dog. Permit the animal to lie quietly near the treatment area. If in doubt, ask the patient how the dog should be handled during treatment.

f. Dental treatment plans for blind patients must consider their disability. Problems with oral hygiene maintenance, difficulty with insertion or removal of partial dentures, and a strong tendency to become anxious over proposed or necessary changes in their oral status must be considered when treating sight-impaired patients.

2. **MS (Multiple Sclerosis)**

a. Patients with MS are suffering from a progressive disorder that eventually results in paralysis. Treatment plans must take into account current as well as projected limitations in motor skills. For patients with advanced disease, a preventive dental program must include involvement of the nursing staff or other caregiver.

b. Patients with mild MS generally tolerate treatment well. Patients with severe disease may have limited reserve and require short appointments. Decisions about

whether patients should be transferred to the dental chair or treated on a litter should be made on an individual basis.

c. Patients with MS may have difficulty in localizing pain, including oral and perioral discomfort. Before performing extractions, restorations, or endodontics on teeth which the patient suspects to be at fault for oral discomfort, clinicians should unambiguously establish the etiology with all the diagnostic tools at their disposal, including X-rays, CO_2 snow and/or the electric pulp tester.

d. Approximately 1 to 2 percent of MS patients develop trigeminal neuralgia (tic douloureux). These patients generally display tic symptoms at a younger age, and more often in a bilateral distribution, than those without MS. Dentists must be aware to include trigeminal neuralgia in the differential diagnosis of paroxysmal oral/facial pain in this population.

e. Although local anesthesia is the preferred pain control modality, the use of general anesthesia and sedation may be considered on an individual basis.

3. **Degenerative Nervous System Disorders**

a. Patients with degenerative nervous system disorders may demonstrate an extremely broad range of disabilities and dysfunctions secondary to their medical conditions. Limitations in self care and special consideration for the medical regimen must be evaluated prior to dental treatment. Special modifications in dental care delivery may include the use of wheelchair lifts and headrests. Consultation with the primary care physician, nursing staff, and family caregiver, where possible, is indicated. These consultations should not only be at the outset of treatment but throughout active care in order to keep all providers informed and to assure optimum therapy for the patient at all times.

b. Many of these patients display involuntary movements of the head and neck area. Extreme care must be taken in the use of instruments (including handpieces) to avoid causing accidental damage to soft or hard tissues.

c. Dementia patients, regardless of the pathophysiology of their condition, are characterized by progressively poor short-term memory resulting in a potential for agitation, disorientation and inappropriate behavior in unfamiliar settings. More advanced states of the disease are typically hallmarked by incontinency, increasing loss of abilities to perform self-care, limb contractures, and eventually a vegetative state and death. Dentists should be aware that these patients commonly are given neuroleptic medications to control behavior and these often cause a xerostomia that can have disastrous dental consequences.

d. Parkinson's disease is characterized by rigidity, tremor exacerbated by stress, and bradykinesia. Patients may display swallowing difficulties and resultant lack of control of oral secretions, often misinterpreted as an overproduction of saliva. Although these patients tolerate the full range of dental procedures, the dentist must be able to adjust to the patient's tremor and attention must be paid to adequate suction of oral secretions and handpiece irrigant.

e. Patients suffering with any of the degenerative disorders should receive examination, treatment, and initiation of a preventive program as soon as possible.

Preventive measures as well as procedures for removal and care of prosthesis should be taught to at least one family caregiver. The dentist's approach to the actual provision of care must be adjusted according to the individual's behavior. Dental treatment plans should be directed towards an outcome that is reasonable, predictable, and maintainable with functional, relatively stable intermediate states to be achieved during the course of treatment.

f. Concerns for informed consent prior to provision of care must be resolved on an individual basis.

4. **Spinal Cord Disorders and Injuries**

a. The level of spinal cord injury determines the extent of sensory and motor deficit. Patients who have sustained injury to the lower portion of the spinal cord, losing motor control and sensation to the lower extremities, exhibit paraplegia. Paralysis of both upper and lower extremities is termed quadriplegia. All spinal cord injured patients experience loss of bladder and bowel control.

b. Individuals with low-level spinal cord injury usually require no special preparation for receiving dental care, other than barrier-free access to treatment areas.

c. Individuals with higher level injury may require special treatment areas, specific monitoring and delivery modalities and additional personnel for safe provision of dental care. These patients may have impaired ventilation, reduced gag and cough reflexes, and difficulty controlling oral fluids. These problems may complicate the delivery of dental care or the use of dental prostheses and may increase the patient's anxiety. Control of the oral environment during dental procedures often requires attentive suction and assistance from dental auxiliaries.

d. Slow accommodation of the pulse and blood pressure to postural changes, constant surveillance for areas of pressure on weight bearing tissues, the likelihood of unperceived injury, and the inability of the patient to control or move portions of the body protectively require constant attendance of the dentist and assistant in the treatment area when the patient is present.

e. The dental team must be familiar and comfortable with correct wheelchair transfer techniques. Errors place both the patient and caregiver at risk for injuries. Some procedures, including many steps in making complete dentures, are easily performed with the patient in the wheelchair and the patient may prefer that rather than transfer to the dental chair.

5. **Amputations**

a. Amputees require a broad range of dental treatment modifications depending on the limb or limbs involved and the etiology of the injury.

b. Causes of lower limb amputation commonly include trauma, diabetes, and vascular insufficiency. Trauma patients require no special consideration other than unimpeded access to the dental treatment area. Amputees having diabetes or vascular disease must be medically evaluated prior to delivery of dental care. Special attention to the current medical status, including medications and regimen compliance, is essential.

c. For patients with upper limb amputations, the degree of disability must be considered in determining the dental treatment plan; e.g., removable dental prostheses would not be good treatment choices for bilateral upper extremity amputees.

6. **S/P CVA (Stroke)**

a. Individuals who have sustained a CVA may exhibit a wide array of motor, cognitive, and sensory deficits as well as confusional states. Lesions of the brain stem may compromise the gag and swallowing reflexes.

b. The dentist must be particularly attuned to the likelihood of significant coincident medical conditions commonly associated with stroke (cardiovascular disease, hypertension, and diabetes), and be prepared to adjust procedures accordingly. Medical consultation is necessary to coordinate dental treatment with the patient's overall needs, limitations, and rehabilitative goals. Certain patients may require adjustment of Coumadin therapy. Coordination with the physician to adjust PT values to 1.5 to 2.0 times the control will preclude problematic bleeding, yet maintain therapeutic anticoagulation.

c. Various degrees of paralysis frequently follow a CVA. Treatment procedures can be modified as necessary. Treatment plans must take physical limitations into account.

d. Speech impairment following CVA may be of several types. Apraxic patients may be able to articulate words which appear to be coherent responses to questions, but they really are inappropriate. For example, the patient who answers "yes" to questions may appear to be answering appropriately unless some of the questions are worded to require negative or non-yes/no answers. Review of the speech pathology report or consultation with the speech pathologist may be informative. Additional problems with speech after CVA include dysarthria (slurred speech secondary to muscle weakness and poor coordination) and aphasia (defects in higher level language centers).

e. Oropharyngeal sensory and motor deficits will dictate specific modifications of dental care. Swallowing dysfunction (dysphagia) presents compromised protection of the airway and may cause problems with water evacuation during dental treatment. Free flowing impression materials should be avoided. An upright patient position, limitation of handpiece irrigant, and use of a rubber dam should all be considered.

f. It should be kept in mind that patients with stroke-induced oral problems often have difficulty adjusting to their new status; e.g., recent edentulation. Recovery can be facilitated in some patients by constructing dentures which reestablish pre-stroke oral relationships. To ease transition from a natural dentition, immediate denture procedures may be helpful. CVA-induced neuromuscular deficits may lead to an inability to fully utilize well-made dentures. Contours of a new prosthesis may have to mimic features of an old denture. For complete dentures, careful attention should be paid to the tooth placement relative to lips, cheeks, and tongue on both the affected and unaffected side. Post-insertion checks must be especially vigilant as the patient may be unaware of serious denture-related injuries.

7. **RA (Rheumatoid Arthritis)**

a. Patients with RA may have significant disability secondary to degenerative joint changes. Single or multiple joint involvement may be present. Dental treatment must take the limited self-care capabilities of some of these RA patients into account.

b. Patients with involvement of the TMJ (Temporomandibular Joint) should receive special attention ranging from conservative therapy (heat, exercises, anti-inflammatory

drugs, analgesics) to surgery and subsequent prosthodontic rehabilitation. The progressive nature of the disease will necessitate regular recall appointments with attention paid to a continually changing interocclusal relationship.

c. Patients with RA are far more likely to suffer from Sjogren's syndrome, characterized by cessation of salivary gland activity. Dentists must be aware of an subjective patient report of oral dryness, and take appropriate preventive measures (frequent recall, saliva substitute, home care fluoride, etc.) as expeditiously as possible.

8. **Hearing Impairment**

a. Patients with hearing impairment may exhibit fear (or even hostility) because they feel they are not going to understand directions given. They may pretend to hear to avoid embarrassment and thus create problems with accurate communication. The provider should be aware of this and attempt to use visual aids to augment or replace verbalizing.

b. Patients wearing hearing devices may be affected by the high pitched tones that are generated by the use of the handpiece. This irritant may render them less cooperative and amenable to treatment.

c. Similarly, the conduction of the vibrations from the handpiece and burs is more disturbing to the hearing impaired than to the non-afflicted patient. The dentist should be aware of these problems and approach these patients with kindness and understanding.

9. **General Frailty**

Patients suffering from general frailty from a variety of causes have much in common with physically handicapped individuals. Wheelchair transfers, postural changes, impaired ability to perform oral hygiene procedures and difficulty in adapting to oral changes are all relevant issues with these patients. Medical and dietary consultations are of paramount importance.

(d) **Followup**

As eligibility allows, followup appointments will be assured for physically handicapped patients who have undergone dental treatment. For patients who do not retain dental eligibility following institutional care, discharge planning will include assistance in locating a dentist who is skilled and motivated in the treatment of the handicapped and who will provide appropriate followup care.

REFERENCES

1. Dental Care for Handicapped Americans. Special Report Number Two. The Robert Wood Johnson Foundation, 1979.

2. Salley, J.: Dental Care for the Handicapped. Ann. Int. Med. 93(2):362-3, Aug., 1980.

3. Levine, N.: A New Decade--A New Challenge: The Delivery of Dental Service to the Handicapped. Oral Health 70(4):11-14, 1980

4. Niessen, L.C. and Jones, J.A.: Alzheimer's Disease: a Guide for Dental Professionals, Spec Care Dent 6:6-12, 1986.

5. Lloyd, P.M., and Shay, K.: "The Geriatric Patient" in Thornton, J.B.; and Wright, J.T., eds., Special and Medically Compromised Patients in Dentistry, P.S.G., Inc., 49-62, 1989.